Before the
Federal Communications Commission
Washington, D.c. 20554

In the Matter of:	**)**	
Final Unbundling Rules	**)**	**WC Docket No. 04-313**
	)	
Review of the Section 251 Unbundling	**)**	**CC Docket No. 01-338**
Obligations of Incumbent Local	**)**	
Exchagne Companies	**)**	

Statement of
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on Behalf of
Texas Office of Public Utility Counsel
and
The Consumer Federation of America

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SUMMARY

LEGAL FRAMEWORK

The Federal Communications Commission (FCC) remains under a mandate of the D.C. Circuit to conduct an impairment analysis on a market-by-market, element-by-element basis. It did not overturn the analytic framework adopted by the Commission. The Court continues to link structural impediments to competitive supply to cost differences including factors such as declining average costs, sunk costs, competitive local exchange company (CLEC) cost disadvantages and other operational barriers to entry. The ultimate challenge remains identifying where network elements are "significantly deployed on a competitive basis," indicating that the withdrawal of those elements on an unbundled basis would not impair competition.

These comments analyze the deployment of mass market switching with data from Texas and propose a nationwide classification of local markets that meets the court standard for impairment analysis. The economic explanation, analytic framework, and policy recommendations presented are applicable to all markets across the country.

RECOMMENDATION

I recommend that the Commission consider central offices in which there are five or more CLECs provide mass-market service without utilizing ILEC switching, one of which has achieved a penetration of one percent of the market, to be unimpaired. The presence of five CLECs in a central office is a solid indicator that the market will support competition. The CLEC can be serving customers in many central offices with one switch and it would be counted in all central offices where customers are being served. This is a fundamentally

economic definition of the switching market that is not tied to an arbitrary physical definition and assumes CLECs are capturing available economies of scale.

The count of CLECs includes CLECs using their own loops (cable operators) and counts all CLECs that serve the mass market, whether or not they serve residential customers. A size threshold of 1% penetration by one CLEC is intended to reflect the broad array of economic factors that impair self-supply of use of switches. It constitutes a very small scale of entry in most central offices (50 to 300) customers.

A central office is marginal where there are five or more CLECs serving mass market customers without using the incumbent's switch, but no CLEC has achieved a substantial market penetration (i.e. greater than 1%) or where 3 to 4 CLECs provide mass-market service without utilizing ILEC switching and at least one CLEC has achieved a substantial market penetration (greater than 1% in the central office). In these central offices the Commission should establish a process for examining the economic conditions in more detail. All other central offices should be considered impaired.

The incumbent local exchange carriers should petition the FCC for the classification of nonimpairment. They have the necessary data, which is quite simple – a count of CLECs actually servicing mass-market customers. The Court requirement for granularity makes such a micro level determination necessary.

ECONOMIC FRAMEWORK

The analysis starts from the observation that entrants must look at switching as a large, up front and generally sunk cost. It is a lumpy investment and collocating imposes substantial

site-specific costs that are sunk. The CLECs have provided detailed cost estimates that show substantial fixed and variable costs of serving customers in remote offices from a distant switch, placing the cost of UNE-L almost 50 percent above the cost of UNE-P. Therefore, economies of scale are critical to the decision to enter the switching market.

Therefore, the primary determinant of switching costs is the number of lines that can be served out of a given office. The smaller the number of lines in an office, the harder it is for new entrants to achieve the scale necessary to make switching profitable. The ability to aggregate customers in a central office will affect the ability to achieve the necessary scale of entry. Thus, the ability to haul traffic from other central offices to a single switch (as through the use of EELs) is important.

Empirical Findings on Entry in Texas

In an econometric analysis, I find that the number of mass market lines in a central office, the mix of enterprise and mass market lines and the availability of extended enhanced loops are the key determinants of entry into the switching market. These factors account for (explain) between two-thirds and three-quarters of the variation in the number of CLECs self-supplying switching.

In over one third of all the central offices in Texas there is no CLEC serving mass-market customers without relying on ILEC switching. In another one-third of the central offices, there are one or two CLECs serving mass market customers and they have an extremely small share of the market. These are generally offices with low line counts, low population densities and high share of mass-market lines as a percent of total lines.

In contrast, about one-seventh of the central offices have five or more CLECs with at least one CLEC having achieved a substantial UNE-L penetration (1% of the lines in the office). On average these offices have about 7 times as many lines per office as the impaired offices; the population density is ten time as large; and the share of enterprise lines is about 50 percent higher. The central offices that are unimpaired are highly concentrated in the "downtown" central offices of the metropolitan statistical areas (MSAs).

CONCLUSION

The characteristics of local markets I have focused on have the same impact on the economics of deployment across geographic areas. If a state is composed of highly many more high density areas, where enterprise customers are more frequent, we would expect to see many more markets where switching is deployed on a competitive basis.

The economic evidence on costs and the pattern of entry indicate that elimination of unbundled switching throughout an MSA, as proposed by the ILECs in the state proceedings would create a huge economic problem for the CLECs. Because of the cost and difficulty of deploying the necessary equipment to a large number of central offices where little or no competitive switching is currently available, many CLECs would be forced to abandon the local market altogether.

I. INTRODUCTION

PURPOSE

My name is Mark N. Cooper. I am Director of Research of the Consumer Federation of America (CFA). On behalf of the Texas Office of Public Utility Counsel[1] and the Consumer Federation of America[2] I have prepared comments in response to the notice in this proceeding. These comments are based upon the analysis I developed for the Texas Office of Public Utility Counsel in the Texas Triennial Order Proceeding.[3] Under the Triennial Order, SBC had proposed that the Texas Public Utility Commission find a condition of non-impairment in six metropolitan areas in Texas. A fully litigated proceeding was conducted, including initial and reply testimony, discovery, cross-examination and briefing. I address the issue of switching for mass-market customers.

My approach is to first review the legal and analytic framework for this proceeding that has emerged from two orders and court remands. I then present my recommendation. I then offer an economic "explanation" for the decision to self-supply switching. I then conduct an analysis of patterns of entry in Texas. The patterns are consistent with the economic explanation. I turn to the policy question of where the Commission can safely conclude that withdrawal of switching as a UNE will not impair competition. In this discussion I consider factors such as how to deal with cable operators in an impairment analysis, whether a threshold level of entry is necessary to demonstrate non-impairment, and how to treat CLECs that serve small business customers, but not residential customers. Finally, I discuss the characteristics of impaired and unimpaired markets.

Granular Analysis Of The Economics Of Entry In Local Telephone Networks

Following the court mandate for a granular analysis[4] the FCC established a framework to allow empirical analysis of the details of market entry into hundreds, if not thousands of local markets.[5] Therefore, the state proceeding elicited data on actual patterns of entry in local markets.

The data and analyses developed in those proceedings are directly relevant to the current proceeding. The Federal Communications Commission remains under a mandate to conduct a granular analysis of impairment that reflects the economic conditions under which network elements are made available to competing local exchange carriers (CLECs).[6]

It is well established that impairment occurs "under certain circumstances."[7] Although the Court rejected the delegation of the fact finding necessary to determine impairment on an element-by-element basis or market-by-market basis, it did not overturn the broad outlines of the analytic framework the Commission established for the states to use in their granular analysis of local markets.

The court was critical of the Commission's decision to base the national finding of impairment "solely on hot cuts."[8] However, the court notes that "other factors were to be considered by state commissions."[9] It summarizes the fundamental principle of the framework as follows:

> The Commission explicitly and plausibly connects factors to consider in the impairment inquiry to natural monopoly characteristics (declining average cost through the range of the relevant market), or at least connects them (in logic that the ILECs do not seem to contest) to other structural impediments to competitive supply. These barriers include sunk costs, ILEC absolute cost advantages, and operational barriers to entry within the sole primary control of

the ILEC.[10]

The Court explicitly avoids commenting on this analytic framework, stating the following, "In light of our remand, this is not the occasion for any review of the Commission's impairment standard as a general matter; it finds concrete meaning only in its application, and only in that context is it readily justiciable.[11]

While fastidiously withholding judgment on the FCC analytic framework, the Court does offer guidance to the Commission in identifying areas where it perceives that the Commission's framework left ambiguity that could become controversial on remand.

> The Commission's definition of impairment is vague almost to the point of being empty. The touchstone of the Commission's impairment analysis is whether the enumerated operational and entry barriers "make entry into a market uneconomic. Uneconomic by whom? By *any* CLEC, no matter how inefficient? By an "average" or "representative" CLEC? By the most efficient existing CLEC? By a hypothetical CLEC that used "the most efficient telecommunications technology currently available? We need not resolve the significance of this uncertainty, but we highlight it because we suspect that the issue of whether the standard is too open-ended is likely to rise again.[12]

Similarly, the court notes in regard to intermodal competition that "the Commission expressly stated that such alternatives are to be considered when evaluating impairment. Whether the weight the FCC assigns to this factor is reasonable in a given context is a question that we need not decide, except insofar as we reaffirm *USTA I*'s holding that the Commission cannot ignore intermodal alternatives."[13]

The measure of availability of a network element also remains open to empirical specification in the court's opinion. It points out that the FCC "never explains why the record

supports a finding of material impairment where the element in question – though not literally ubiquitous – is significantly deployed on a competitive basis."[14] What constitutes "significantly deployed on a competitive basis" remains to be defined.

In the ruling that gave rise to the triennial order and the ruling that overturned it, the Court devoted a great deal of its economic discussion to the range of output over which economies of scale are present.[15] This concern stems from the concern in economic analysis with natural monopoly situations in which costs are declining over the entire range of output. Under such circumstances, only one firm will be viable.

The Analytic Framework Of The Triennial Review

The Triennial Review Order recognizes the complexity of local markets and the need for granular analysis. It rested the definition of markets in which economic entry is feasible on the local market conditions.[16] The market definition must also reflect available scale and scope economies.[17] The identification of the factors affecting competitors is broad.

> To define each market on a granular level one must take into consideration the location and size of customers actually being served (if any) by competitors, the variation in factors affecting competitors' ability to serve each group of customers, and competitors' ability to target and serve specific markets economically and efficiently using currently available technologies… [One must] consider how competitor's ability to use self-provisioned switches or switches provided by a third-party wholesaler to serve various groups of customers varies geographically and should attempt to distinguish among markets where different findings of impairment are likely…
> Consider how UNE loop rates vary across the state, how retail rates vary geographically, how the number of high-revenue customers varies geographically, how the cost of serving customers varies according to the size of the wire center and the location of the wire center, and variations in the capabilities of wire centers to provide adequate collocation space and handle

large numbers of hot cuts.[18]

The identification of CLECs that should be counted for each product market is, of necessity, intertwined with the definition of the market, since the FCC intends to count only those competitors who are "actively providing voice service to mass market customers."[19] Indeed, the FCC emphasized the actual level of activity by stating that "the key consideration… is whether the providers are currently offering and able to provide service, and are likely to continue to do so."[20]

In looking to the evidence of actual market entry, the FCC explicitly rejected the proposition that the mere existence of a facility demonstrated non-impairment. Rather, the nature and extent of market entry were identified as central to the weight that deployment of facilities should be given.

> [I]f the marketplace evidence shows that new entrants have deployed a certain type of facility, we will consider the facts as evidence that the barriers to entry in that market for that element are surmountable. In deciding what weight to give this evidence, we will consider how extensively carriers have been able to deploy such alternatives, to serve what extent of the market, and how mature and stable the market is.[21]

The Commission went on to reject a count of lines (3 percent of the national total) as the basis for a finding of non-impairment.[22] Thus, not only did the commission reject the mere presence of a competitively supplied element as an indicator of non-impairment, it also considered a substantial level of market penetration of that competitively supplied element to not be dispositive of the issue of non-impairment. The mere presence of a facility does not automatically equate to "significant deployment on a competitive basis."

When the FCC discusses the number of CLECs, it uses a strong term, noting that "if a

carrier were to acquire the long term right to the use of a non-incumbent-LEC switch sufficient to serve a substantial portion of the mass market, that carrier should count as a separate, unaffiliated self-provider of switching."[23]

Concern about coverage of the mass market was not limited to geographic scope or persistence across time. The FCC also expressed concern about covering all customer classes, defining the market by the "factors affecting competitors' ability to serve each group of customers." Within the mass market, there are only two groups of customers identified by the FCC – "mass market customers consist of residential and very small business customers."[24] The FCC notes that "there are some differences between very small businesses and residential customers."[25]

Thus, the nature, extent and stability of the market that is addressed by a specific facility are the focal points of the market definition and trigger analysis.

Further, the Commission gave examples of how a variety of factors might influence the simple counting of competitively deployed facilities, but did not restrict the factors to the examples offered. "In circumstances where switch providers (or the resellers that rely on them) are identified as currently serving or capable of serving, only part of the market, the… commission may choose to consider defining that portion of the market as a separate market for purpose of its analysis."[26]

Partial coverage of the market can be both geographic and by customer class.

The commission also notes that the presence of certain CLECs might indicate less about impairment than others. In particular, operators using their own loops may have different economic structures. "We recognize that when one or more of the… competitive providers is also self-deploying its own local loops, this evidence may bear less heavily on the ability to use a self-deployed switch as a mean of accessing the incumbent's loop…"[27]

In paragraph 510, it reiterates the possibility of discounting cable operators as CLECs, stating "Whether this competitor is using the incumbent's loops or its own loops should bear on how much weight to assign this factor."[28]

Guidance on how to assess the ability to provide and continue to provide service can be found in the underlying finding that led the commission to elicit state support in conducting granular analysis. The FCC states that "we are persuaded that other economic factors, in addition to the economic and operational barriers associated with the current hot cut process that we have already identified, may make entry uneconomic without access to the incumbent's switch."[29] The FCC states that "no factor should be considered in isolation."[30]

> If nothing else, the evidence provided to us demonstrates that whether entry will be economic depends critically on the values of certain factors affecting a competing carrier's likely costs and revenues, and that these factors vary significantly among locations and types of customers.*/
> */ To utilize a UNE-L strategy, which is the most likely network architecture a new competing carrier would use to serve a mass market voice customer in the absence of unbundled switching, a competing carrier would have to incur costs for the loop, backhaul, collocation space, digitizing and aggregating equipment in the customer's wire center, a switch, interconnection, transport, and the transfer of the customer to its switch using a hot cut, as well as internal administrative costs, the cost of capital, and other costs. Likely revenues depend on the prevailing retail rate and other revenues to be gained from selling local service, including those associated with access charges and vertical features. Also important is whether a competing carrier can sell other products in the region or wire center, which might generate sufficient revenues to help justify expenditures on collocation, backhaul, and a switch.[31]

Insight into the ability of CLECs to actively and continually provide service can also be gained by considering the factors that the FCC identifies in the potential competition analysis. The Commission should not ignore how these two steps fit together.

Among the operational barriers, the Order recognizes that "difficulties in obtaining collocation space due to lack of space or delays in provisioning by the incumbent LEC, and difficulties in obtaining cross-connects in an incumbent wire center, are making entry uneconomic for competitive LECs."[32] The FCC made it clear that these were examples, which did not go to the national impairment finding but "evidence of whether operational conditions permit or prevent competitive entry in each market."[33]

When the FCC notes the connection between enterprise and mass-market switches, it adds that if "these providers are operationally and economically capable of serving the mass market, this evidence must be given substantial weight."[34] It goes on to suggest economic factors that might come into play. In paragraph 510 it notes that one

> should consider whether the entire market could be served by this switch.*/
> */ For example, a mass market switch with relatively high variable costs per customer (*i.e.*, in cases where the cost of acquiring and service each additional customer is high, excluding the fixed cost of energy and collocation) may be able to serve only high revenue customers in the market economically. These variable costs would be determined by hot cut costs, churn, loop costs, and other customer-acquisition outlays.[35]

This set of factors is identified to ensure that the analyses reflect the empirical reality of entry into local mass market switching. These criteria interact to provide the commission with information to make a judgment about the level of activity and the ability of CLECs to continue to provide services to mass-market customers.

RECOMMENDATION

I classify central offices in the areas where SBC has asked for an impairment analysis

into three categories, impaired, marginal and unimpaired. Of course, there is a fourth type of office in Texas – those in which SBC has not sought an impairment analysis. I call these uncontested central offices. I show that because of their economic characteristics they are not likely to be very competitive.

I recommend that the Commission consider central offices in which there are five or more CLECs providing mass-market service without utilizing ILEC switching, at least one of which has achieved a penetration of one percent of the market, to be unimpaired. In these central offices, removal of UNE switching would be undermine competition.

The presence of five CLECs in a central office is a solid indicator that the market will support competition. Let me be clear here. The CLEC does not actually have to have a switch in the office, it only must be serving customers in the central office without using ILEC switching. It could have a switch in a single central office that serves many other central offices. It would be counted in all central offices where customers are being served with that switch, no matter where it is located. This is a fundamentally economic definition of the switching market that is not tied to an arbitrary physical definition. It is where you serve, not where you are located that matters.

The presence of five competitors also has a grounding in the ecoomic policy and antitrust contexts. Antitrust practice defines a marekt with fewer than six equal-sized competitors as highly concentrated. While the CLECs we count would certainly not be equal in size the ILEC, the total number serving customers with their own swithcing would be six.

Moreover, the count of CLECs I apply includes CLECs using their own loops (cable operators) at full weight. Similarly, I count all CLECs equally, even though some might not be offering service to residential customers. This overstates the extent of competition for an important

group within the mass market, i.e. residential class.

A size threshold of 1% penetration by one CLEC is intended to reflect the broad array of economic factors that impair self-supply of use of switches. It constitutes a very small scale of entry in most central offices (50 to 300) customers and provides useful information about the active nature and ability to continue to provide service in a market.

I categorize a central office as marginal under two conditions.

Central offices with five or more CLECs serving mass market customers without using the incumbent's switch, and where no CLEC has achieved a substantial market penetration (i.e. greater than 1%) served in this manner, should also be considered marginal. In these central offices the Commission must look carefully at the manner in which CLECs are serving customers and the economics of switching to ascertain that the necessary economies of scale to support switching competition can be achieved.

Those central offices with 3 to 4 CLECs providing mass-market service without utilizing ILEC switching and at least one CLEC has achieved a substantial market penetration (greater than 1% in the central office) in this manner should be considered marginal. Here the Commission should assure itself that the switching arrangement being used could be replicated by others to serve both residential and small business customers. In these central offices the Commission should establish a process for examining the economic conditions in more detail.

All other central offices should be considered impaired.

Thus, following the FCC's charge that no factor should be considered in isolation and given the numerous concerns and complex set of factors that the FCC ordered the states to consider in their fact finding, I believe my approach is fully supported by the analytic framework.

Having defined the conditions of non-impairment precisely by a readily measurable trait of the central office, the incumbent local exchange carriers should designate the markets for classification as unimpaired by filing a petition at the FCC. They have the necessary data, which is quite simple – a count of CLECs actually serving mass market customers and the percentage of lines served. The Court requirement for granularity makes such a micro level determination necessary. The FCC could enlist the assistance of the state commissions in reviewing the filings for classification. This is a level of involvement of states that requires less delegation than the TELRIC proceedings.

II. THE PATTERNS AND ECONOMICS OF SWITCHING ENTRY

The FCC's analytic framework and the process it outlined for making granular determinations of impairment dictated the nature of the data produced in the state proceedings. The FCC established a default starting point of three CLEC's self-supplying switching as the initial threshold. The complex factors cited above could be used to move that number up or down. Moreover, the ILECs initiated the process by nominating network elements and geographic areas as candidates for a finding of non-impairment. The ILEC started the process. The fact that the ILECs have control of the most critical data also influenced the proceedings. Thus, the analysis must start with where the ILECs chose to declare non-impairment. SBC has adopted a loose product definition and a very broad geographic definition.

PRODUCT MARKET DEFINITION

I believe that SBC's product definition may be correct from an economic point of view. SBC identified all the central offices in which CLECs are serving mass-market customers without relying on ILEC switching.[36] That is the correct definition from the point of view of an economic impairment analysis. As long as the CLECs are getting the job done (self-supply, wholesale, transport from remote locations back to a single switch) that is what matters.

However, from a public policy point of view, the loose definition may raise some concerns. If the approach that a CLEC uses to getting the job done is "unique" to that single CLEC and no other CLEC could replicate it and be economically viable, then competition would be impaired if unbundled switching were withdrawn from the market. Thus, this product definition is the

correct place to start, but under some circumstance we must dig a little deeper to answer the policy question before the Commission – would the withdrawal of the UNE for switching impair competition generally?

The SBC product market definition is loose in two respects (see Exhibit MNC-1). All of the central offices enclosed within the dashed square in Exhibit MNC-1 are identified by SWBT as having 3 or more CLECs serving mass market customers in a given central office without using ILEC switching. Two of these cases are a source of concern (the central office are outlined in bold in Exhibit MNC-1).

SBC identifies all CLECs in a given central office who are serving mass-market customers without utilizing an ILEC switch in that office. There are three ways in which this could be accomplished. The CLEC could be self-supplying switching with its own switch in that office. It could be transporting local traffic from the central office to its own switch in another central office. It could be buying switching services from some other CLEC in the central office.

My concern is that it is conceivable that there is only one CLEC providing switching services in some offices where SBC counts three or more CLECs. That CLEC could be self-supplying and selling wholesale switching services to two other CLECs. If switching (and therefore UNE-P) is withdrawn under these circumstances, CLECs who are not self-supplying switching could be subject to the exercise of market power. Switching prices could rise sharply, thereby undermining their ability to compete.

There is a second situation in which the loose definition could come into play. SBC has identified all CLECs serving customers with three or fewer lines, but several CLEC have declared that they do not serve residential customers. In these circumstances, switching services (and

therefore UNE-P) might be withdrawn in circumstances in which switching for residential customers is not available. A business model that works for small businesses, might not work for residential customers, who would be left with few choices.

I want to flag these two situations as potential problems in particular circumstances. It will become apparent after the discussion of geographic market definition why these situations may matter.

GEOGRAPHIC MARKET DEFINITION

SBC defined the geographic market as an entire Metropolitan Statistical Area (MSA). This is far too broad. SBC has claimed non-impairment throughout an entire MSA, when there are three or more CLECs in any central office within the MSA. In fact, there are very few central offices that have that level of competition within the MSAs identified by SBC. The evidence shows that it is not economic to serve residential customers remotely throughout an MSA. Given the way SBC has presented the data and defined markets, for purposes of the analysis I conclude that the central office is the relevant unit of analysis. However, an empirical examination of patterns of entry by CLECs shows that there are clusters of central offices that support a finding of nonimpairment.

The geographic market definition is extremely broad. Viewing Exhibit MNC-1 as an entire MSA, SBC requested switching be withdrawn in the entire area even though many central offices do not have any CLECs self-supplying switching. SBC admits that it does not use this market definition in its normal business practices.[37] CLECs do not use this market definition.[38] It is evident that CLECs do not behave as though this is a relevant market.

Moreover, SBC states that it believes placement of a switch in a central office to serve customer loops within that office is the efficient way to provision local service.[39] It does not use transport to a neighboring central office to relieve switch exhaust. The fact that there are multiple CLECs with a switch someplace in an MSA does not mean that they could economically serve offices in which no CLEC switch is located.

The extreme nature of the assumption that the MSA is a market is apparent from the distribution of CLECs across central offices. In the six MSAs in which SBC is seeking to withdraw switching and UNE-P, about one-third of the central offices have no CLECs serving mass market customers without using ILEC switches (see Exhibit MNC-2). One-fifth of the central offices have only one CLEC serving customers without ILEC switches and eleven percent has two. In other words, approximately 50 percent of the central offices are below the FCC threshold.

Moreover, because of the manner in which SBC has defined the product and identified the trigger CLECs, this takes into account aggregation of switching services. In other words, to the extent that CLECs are serving mass market lines in central offices by transporting traffic to a switch in another office in the MSA, that is already counted as switching "competition" in the remotely served office.

In each of the MSAs approximately one-half or more of the central offices have fewer than three CLECs serving customers without ILEC switching. On the competitive side, about one quarter of the central offices have five or more CLECs. One MSA has no central office with five or more CLECs; none has more than 30 percent of its central offices with five or more CLECs.

For so many offices to be below the threshold with this loose definition of "independent" switching suggests to me that the geographic market is too broadly defined. To get around this fact that argues against the broad market definition, SBC splits the definition of the market from the assessment of entry. It defines the geographic market very broadly as an area in which a CLEC could serve anyone (i.e. mass market or enterprise). It discovers that some CLECs do serve some customers in some parts of the broadly defined market and asked the Commission to remove mass market UNE switching throughout the entire geographic. It ignores the fact that in more than half the central offices no one is serving mass-market customers without relying on ILEC switching. It brushes this fact aside by claiming that fixed and variable transport costs do not matter, although it provides no economic analysis of this proposition.

In fact, CLEC present evidence to the contrary. The CLECs have provided detailed cost estimates that show substantial fixed and variable costs of serving customers in remote offices from a distant switch. The cost estimates are quite substantial. These estimates put the cost of UNE-L almost 50 percent above the cost of UNE-P. The increase in cost is equal to about one-fifth of the typical revenue for a residential customer. These are costs that cannot be ignored.

ECONOMIC BARRIERS TO ENTRY INTO LOCAL SWITCHING MARKETS

The economics of switching markets underlies this pattern. The key point to keep in mind is that entrants must look at switching as a large, up front and generally sunk cost. It is a lumpy investment and collocating imposes substantial site-specific costs that are sunk. Therefore, economies of scale are critical to the decision to enter the switching market.

The primary determinant of switching costs is the number of lines that can be served out

of a given office. The smaller the number of lines in an office, the harder it is for new entrants to achieve the scale necessary to make switching profitable.

Since we are focused on the mass market, the number of mass-market lines is the critical point, but presence of enterprise lines in a central office can play a role. If there are a large number of enterprise lines, or they constitute a higher proportion of lines in a central office, this may make it possible to enter to serve both customer categories. Enterprise customers are more attractive because they tend to have multiple lines and therefore generate larger revenue streams for the switch. Serving both markets makes it easier to achieve the economic scale needed across switching and other cost categories.

The ability to aggregate customers in a central office will affect the ability to achieve the necessary scale of entry. Thus, the ability to haul traffic from other central offices to a single switch is important. Here we would expect to see that the availability and price of EELs is important.

Another way to overcome the economies of scale is to replace them with economies of scope. That is, revenues per switch can be raised not only by winning more customers, but also by selling more services per customer. One extremely important add on service is DSL. The prevalence of digital line carrier technology affects this possibility, since it is a barrier to selling a voice/data bundle. Moreover, IDLC has been a particular source of concern to CLECs who want to buy unbundled network elements.

Since switching costs are largely invariant to geographic location – the cost does not vary a great deal between urban and rural central offices – rate groups and UNEs also play a role in the decision to enter the market in general. Lower density rate groups have higher UNE prices,

which reduces entry. The lower the margin for mass-market service, the less likely entrants are to sink their capital into such markets.

I tested these observations with data on the characteristics of central offices and the pattern of entry by CLECs.

III. EMPIRICAL ANALYSIS

In order to demonstrate this economic explanation of the pattern of switching entry, I constructed a database of the central offices in Texas and examined the characteristics of those offices that would affect the economics of entry.

THE DATA BASE

I used the data provided by SBC (see Exhibit MNC-3). The critical data identifying the central offices where CLECs are serving the mass market without using ILEC switching was provided at the level of the Common Language Location Indicator, 8-digits (CLLI8) central office classification. Data provided at the CLLI11 level was aggregated to the higher level. Moreover, because the critical economic factors are the number of mass market lines and the ratio of enterprise lines to mass market lines, I excluded any central offices for which these critical data points were missing. The resulting data set included 512 CLLI8 central offices statewide and 164 central offices in the target MSAs. This covers a large part of the SBC service territory and almost all of the central offices in the target MSAs.

ANALYSIS OF THE ECONOMICS OF ENTRY INTO THE SWITCHING MARKET

Looking at each of these factors noted above individually we find that the hypothesized relationship between switching entry and the economic variables is in the expected direction and statistically significant (see the top half of Exhibit MNC-4). With the exception of digital line carrier, all of the correlation coefficients have the correct sign and are statistically significant at the .01 level. They exhibit moderate to strong relationships between the characteristics of the

central office and the number of CLECs in the switching market in that office. The magnitude of the correlations is similar in the analysis of all central offices (where the uncontested offices are coded as –1) and in the central offices that have been targeted for impairment analysis by SBC.

This observation holds up in a multiple regression approach as well (see the bottom half of Exhibit MNC-4). Except for digital line carrier, each of the characteristics enters into the regression equation with a statistically significant effect in the predicted direction. Digital line carrier enters into two equations with a statistically significant coefficient in the expected direction. The two most critical characteristics, the number and mix of lines enter into every regression equation at every level, state, targeted MSAs together and individual MSAs. Use of EELs enters into the majority of equations. DLC enters into the equations for a couple of MSAs. UNE rates are important in the statewide and target-MSA levels because within MSAs there is little variation.

The number of mass-market lines in a central office exhibits a strong relationship to the number CLECs in the switching market (see Exhibit MNC-5). There does appear to be a critical size at 20,000 to 25,000 lines. In fact, the sharpest break appears to come at 23,000 lines. In the full data set, this factor alone explains over one-third the variance in the number of CLECs in the central office switching market. In the target MSAs, it explains about one quarter.

The availability of enterprise customers in a central office is also consistently related to the level of switching entry and appears to exhibit an even sharper threshold effect (see Exhibit MNC-6). Once the ratio of enterprise lines to mass-market lines exceeds .04 in a central office, the presence of switching competition increases sharply.

Taken together, these two thresholds characteristics appear to be necessary and sufficient conditions for a high level of switch entry (see Exhibit MNC-7). Virtually every office with four

or more switch competitors has one of these two characteristics. Three quarters of the offices with three competitors has one of these characteristics. In contrast, for central offices with two CLECs, the percentage is about 45. For those with one CLEC it is less than 20. For those with no CLECs, it is less than 10.

There are two important conclusions that can be drawn from the fact that these two characteristics of central offices explain the pattern of switching entry. First, policymakers cannot ignore the result. They should conclude that the central office is the proper unit of analysis and that there is not likely to be significant switch deployment that does not reflect these critical economic factors.

Second, if policy makers want more customers served by competitive switching, they will have to institute policies to extend the reach of the central office. That leads to the EELs policy. Yet, as currently configured in Texas, EELs policy has not solved the problem. The current level of switching entry includes the current EELs policy, and still large numbers of central offices do not exhibit high levels of switching competition.

Exhibit MNC-8 shows the pattern of reliance on EELS. CLECs tend to use them more in the offices that lack the economic characteristics that support entry. Where offices have fewer lines and fewer enterprise customers, CLECs rely more on EELs. Unless the EELs policy covers the entire geographic area that the commission chooses to define as the relevant switching market, then the market will be too large and there will be many central offices where the removal of UNE-P will impair competition. In other words, the cost of transport between central offices determines the scope of the market where central offices lack the sufficient number and favorable mix of lines.

SBC makes a great deal of the fact, on the demand side, that CLECs may advertise service throughout an MSA. However, this tells us little. The fact that CLECs advertise their service throughout the MSA is based on the premise that when they offer service, they have a range of options for provisioning the customers that they win. It is the very existence of UNE-P that allows them to offer service in a wide area. Without UNE-P they might never have advertised in such a broad area and if UNE-P is withdrawn, they could be forced to withdraw the offer of service throughout the MSA, precisely because they cannot offer services economically in many parts of the MSA.

This data makes a strong case that competitors enter switching markets where it makes economic sense for them to do so. Just because they can make a go of it in one office does not mean they can make a go of it in another. Just because one firm's business model is suited to a particular situation does not mean that others can replicate it in that office, or that it can be replicated in other offices. Moreover, once a CLEC has deployed a switch in a market, it has an incentive to serve as many lines with that switch as possible. If there are no administrative or cost impairments, the CLEC will prefer to use its own switch rather than pay the ILEC for switching. Exhibit MNC-9 shows the pattern of entry into the switching market. CLECs generally enter into several areas and serve mass-market lines in a number of central offices in each area. As we have seen, they cluster in those offices with critical economic characteristics. Once the switch is deployed, the economic rational thing to do is to serve as many offices from that switch as possible.

POLICY CONSIDERATIONS IN SETTING THE THRESHOLD

Having defined markets by economic characteristics, the policy question is whether the Commission can conclude that there is enough entry to indicate that withdrawal of switching would not impair competition in that market. Are the conditions of entry such that CLECs can be viable without access to ILEC switching at unbundled rates? The FCC adopted a default starting point, but also recognized that the economics of local markets are complex, so the states can use their expertise to assess the local conditions. The court has flagged several issues without taking a position on them. I address the key points of discussion in this section.

Three critical policy issues arise. How should the commission treat cable? Is there a minimum threshold for the level of entry that indicates entry into the switching market is economically viable? Should competition for residential customers be analyzed separately?

Cable: The reason cable entry into the market must be analyzed separately is that it may not tell us anything about entry by others into the market. This is an impairment analysis, not a simple competition analysis. The purpose is to assess the ability of CLECs to enter the market with their own (or wholesale) switching.

Cable is in a unique position, as the owner of its own last mile facilities. It enters the telephone market with a monopoly video wire that adds incremental switching and operates as a closed system. No other CLECs are in this situation (except for occasional overbuilders, who are extremely rare). The economics and incentives of cable entry are quite different than the economics and incentives of other CLECs and cannot be replicated by other CLECs.

Because of the pattern of entry by cable operators in Texas, it turns out that this is not a critical issue (see Exhibit MNC-10). Cable operators have tended to enter the telephone market

in areas that are also served by a large number of CLECs, so eliminating cable from the CLEC count shifts a small number of offices from the marginal category into the impairment category. I believe that the Commission should count cable.

Exhibit MNC-11 shows the results of the market structure analysis conducted with cable operator excluded. The results are similar to the earlier analysis. Removing cable has little effect on the picture I painted earlier of the economics of switching entry.

Minimum Size: The concern about the size of the CLECs is driven by the fundamental question of what the presence of a CLEC serving mass market customers might indicate about the impact of the withdrawal of unbundled switching. A CLEC serving only a few lines, perhaps on a test basis, may not indicate that self-supply or wholesale purchase of switching is viable on a large scale or in a broad geographic area. In order to indicate economic viability of switching entry, the entry should be substantial.

Picking a minimum size is more complex that the cable question. The idea of an impairment analysis is to ascertain whether long-term entry into the switching market is viable. The presence of a very small CLEC, recently entered in the market, may not answer the relevant policy question. On the other hand, once a non-trivial number of lines within a central office are served by a group of CLECs that may indicate entry is attractive. Do five CLECs, each serving two percent of the market tell us more or less about the viability of switching entry than three CLECs each serving three percent of the market? Does one CLEC serving five percent of the market combined with two serving two percent tell us more?

The FCC mentioned a figure that equaled three percent of lines being served on a nationwide basis as not an indication of a lack of impairment. Conceptually, the question is

whether the scale of entry is sufficient to make the switch investment economically viable. If one entity has achieved sufficient scale to be viable, what does that tell us about other entrants? If it is their business plans or implementation that is lacking, not the underlying market conditions, then the impairment is not a market problem. Therefore, in conjunction with other criteria, and because I rely on the central office as the unit of analysis, I believe it is consistent with the FCC reasoning to establish a screen of a 1% market share for at least one CLEC serving mass market customers without reliance on ILEC switching. If the unit of analysis is larger, I believe the threshold should be higher.

Exhibit MNC-10 shows that even this low threshold has a significant effect on the categorization of central offices. Almost two thirds of the central offices with three or four CLECs serving mass-market customers without relying ILEC switching, fail to meet this threshold (the percentage that falls into the marginal category fall from 14% to 5%). Because these central offices have a small number of CLECs who have only achieved a small size, these offices should be considered impaired.

Residential Customers: Although the FCC defined the mass market as combining both residential and small business customers, it did express a concern that both classes of customers are served. To the extent that the economics differ between residential and small business customers (perhaps because their rates differ), the fact that a CLEC serves only business customers would be a concern. Withdrawal of switching may impair competition for residential customers. Here the critical factor is the much greater importance of UNE-P to competition in the residential market. The annual report on competition from the PUC shows that two thirds of CLEC residential lines are provisioned by UNE-P, compared to about 45 percent of CLEC business lines.[40]

The data available do not allow me to address this issue. Therefore, no "adjustment" for mass-market, non-residential-only CLECs is made.

PATTERNS OF IMPAIRMENT AND CHARACTERISTICS OF UNIMPAIRED MARKETS

Exhibits MNC-12 through MNC-16 show the five MSA's in which I find there are offices that are unimpaired or marginal. I have plotted them first against by longitude and latitude of the central office, then with an MSA zonal map. The very narrow geographic scope of entry in each of the MSAs is evident in these maps.

The geographic concentration of switching entry (the footprint of competition is concentrated) is in a small number of zones at the core of the exchange. The outlying central offices have little switching entry.

Because the economics of telecommunications drive entry by CLECs into larger central offices, this categorization results in a substantial finding of non-impairment (see Exhibit MNC-17). Offices that serve approximately 17 percent of the mass-market lines in the MSAs for which SBC has sought an impairment proceeding would be considered unimpaired. Offices that serve another 30 percent of the mass-market lines would be considered marginal. The number of central offices that demand closer study is relatively small, just over 30. Moreover, the status of over 80 percent of the central offices and over 70 percent of the lines is "decided" in this first round of analysis.

Exhibit MNC-18 shows several key characteristics of the central offices in the impairment categories I have identified. These are from a second database that was entered into the record in Texas. The impaired and marginal offices much lower line counts and line densities, ratios of

enterprise customers and numbers of collocation cages. This data indicates that there is not "significant deployment on a competitive basis" in these areas. That lack of deployment is closely associated with economic characteristics that suggest economies of scale and density are the key factor. CLECs have put switches in offices that can reach a sufficient number of potential customers to make them economically viable, given the costs of remotely serving customers. The costs of EELs and aggregation could be lowered to make the reach of economically viable self-supply broader, but those are factors within the control of the ILECs.

I believe the lack of entry in many central offices combined with the reliance on UNE-P would undermine competition if switching were withdrawn. Almost half the UNE-P lines in the target MSAs are in offices that fall into my impaired category. Another one-fifth fall into the marginal category of a small number of CLECs with no large CLEC. Given the economic analysis in the record, elimination of UNE-P in these offices would create a huge economic problem for CLECs because of the cost and difficulty of deploying the necessary equipment to serve these offices remotely, not to mention deploying switches. With two-thirds of the offices in an MSA impaired, CLECs could well be forced to abandon the broadly defined market.

TRANSITIONING TO UNE-L

The FCC emphasizes that the transition to UNE-L must be smooth. The court rejected the problem of hot cuts as the basis for a national finding of impairment, but it did not dismiss it as a concern at a more granular level. I believe that my approach affords the hot cut issue its proper role. I believe that the nonimpairment finding could be implemented only with a smooth process for transitioning UNE-P to UNE-L is in place. The comments of the CLECs identify

several situations in which there would appear to be a pervasive and widespread obstacle to a smooth transition.

First, there are two situations in which SBC is unwilling or unable to perform a transition without imposing severe operational or economic disruption on the CLEC. Where ILDC is the loop technology, the transition process is costly and disruptive. Therefore, these lines must be considered impaired in all central offices. Similarly, SBC imposes a costly and disruptive process for ordering and (therefore transitioning) lines loops where CLECs are provisioning both voice and DSL service. These loops should also be considered impaired in all offices.

Second, as noted earlier, the lack of lines served with non-ILEC switching in many central offices suggests that there would be a severe disruption in most offices should switching be withdrawn. If the Commission starts with the central offices I have identified, a large number of lines will have to be transitioned to UNE-L. This will be a formidable challenge itself. I believe the Commission should start in these central offices. It should require new UNE-P customers to be signed up until the entire backlog of UNE-P customers has been switched to UNE-L. Once all customers who were on UNE-P as of the date of the start of the transition have been cut over, no new UNE-P customers should be allowed in the nonimpaired offices. Of course, ILECs will have to transition UNE-P customers added after the issuance of the order to UNE-L. This gives ILECs an incentive to move the transition along as quickly as possible and ensures that there will be no disruption of the competitive environment.

After the unimpaired offices have been transitioned to UNE-L, the Commission should re-examine the marginal offices with 5 CLECs, but no large CLEC. If it determines that these are not impaired, SBC will be confronted with transitioning another large block of lines.

ENDNOTES

[1]The Texas Office of Public Utility Counsel's (OPUC's) is an independent agency, separate from the state's Public Utility Commission of Texas (PUC), created to represent the interests of 9 million residential and small commercial customers in state and federal utility matters before the PUC, FCC, courts, and other utility regulatory agencies.

[2] The Consumer Federation of America is the nation's largest consumer advocacy group, compose of two hundred and eighty state and local affiliates representing consumer, senior citizen, low-income, labor, farm, public power and cooperative organizations, with more than fifty million members.

[3] Direct Testimony Of Dr Mark N. Cooper On Behalf Of Texas Office Of Public Utility Council, Amended Proprietary Material Redacted Impairment Analysis Of Local Circuit Switching For The Mass Market, Before The Public Utility Commission of Texas, PUC Docket No. 28607, February 9, 2004; Rebuttal Testimony, March 19, 2004.

[4] United States Telecom Ass'n v. FCC, 290 F.3d 415 (D.C. Cir. 2002) (USTA I).

[5] Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, 18 FCC Rcd (2003) (*Triennial Review Order).*

[6] *United States Telecom Ass'n v. FCC*, 359 F. 3d 554 (D.C. Cir. 2004) (*USTA II*), *pets. For cert. Filed,* Nos. 04-12, 04-15, 04-18 (June 30 2004), p. 15.

[7] *USTA II*, p. 2.

[8] *Id.*, p. 13.

[9] *Id.*, p. 13.

[10] *Id.*, p. 15.

[11] *Id.*, p. 15.

[12] *Id.*, p. 16.

[13] *Id.*, p. 16.

[14]*USTA I*., p. 7.

[15] *USTA I*, p. 10; *USTA II*, Id., p. 16.

[16] *Triennial Review Order,* para 493.

[17] *Id.*, para. 495.

[18] *Id.*, para. 495… 496.

[19] *Id.*, para. 500.

[20] *Id.*, para. 500.

[21] *Id.*, para. 94.

[22] *Id.*, para. 438-440.

[23] *Id.*, para. 499, note 1551.

[24] *Id.*, para. 127.

[25] *Id.*, para. 127, note 4432.

[26] *Id.*, para. 499, note 1552.

[27] *Id.*, para. 502.

[28] *Id.*, para. 510.

[29] *Id.*, para. 484.

[30] *Id.*, para. 484, note 1497.

[31] *Id.*, para. 484.

[32] *Id.*, para. 511.

[33] *Id.*, para. 511, note 1573.

[34] *Id.*, para. 507.

[35] *Id.*, para. 510.

[36] SBC, Joint CLEC, 1-11.

[37] SBC, Joint CLEC, 1-13

[38] All of the CLECs state that the MSA is not a relevant business unit of analysis.
[39] SBC, Joint CLEC, 1-9a.
[40] *Scope of Competition in Texas Market* (Austin: Public Utility Commission of Texas, 2003), pp. 27-29.

EXHIBITS

EXHIBIT MNC-1:
VARIOUS TYPES OF CENTRAL OFFICES IN AN MSA UNDER THE LOOSE PRODUCT AND BROAD GEOGRAPHIC MARKET DEFINITION IN THE SBC PROPOSAL

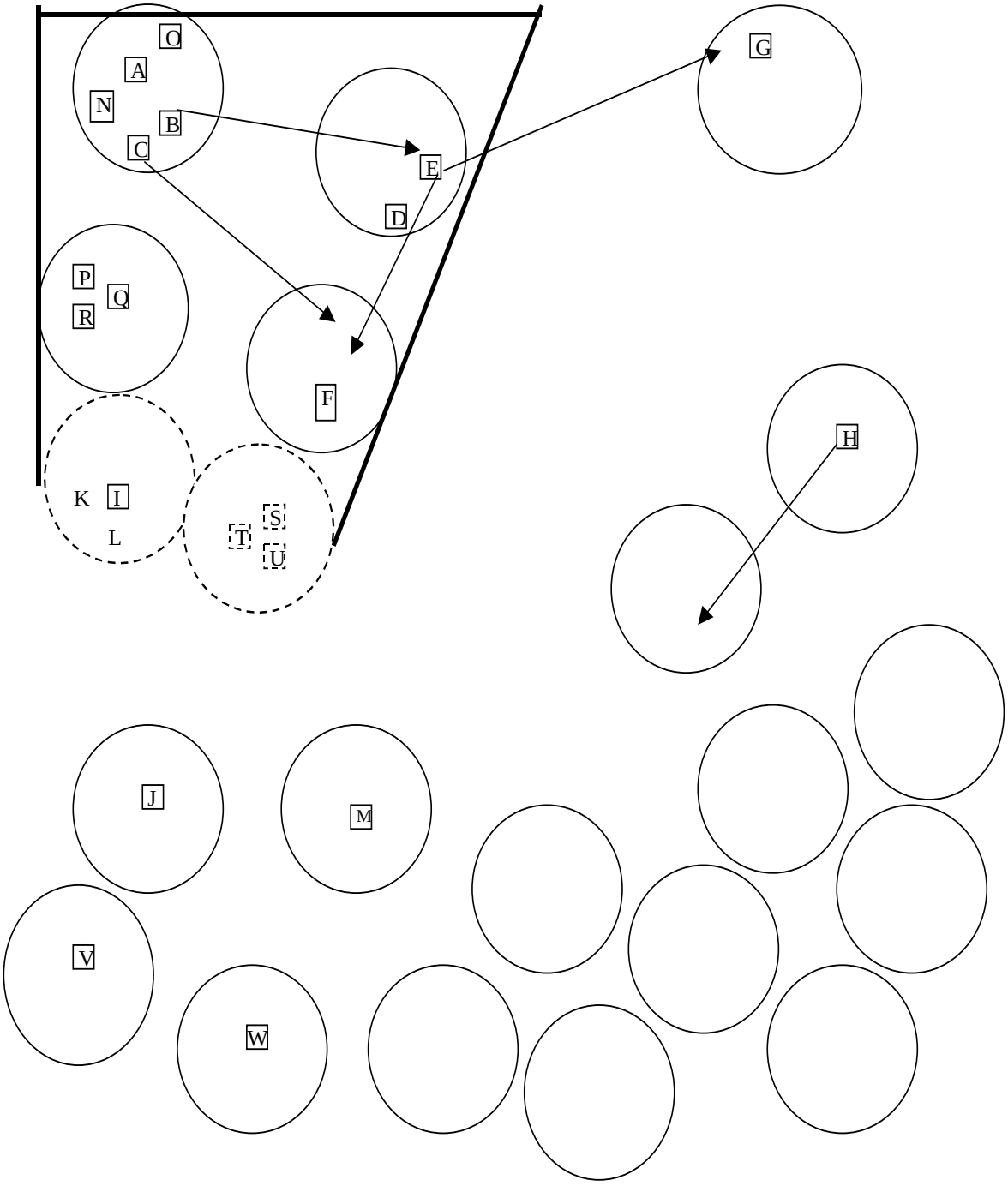


EXHIBIT MNC-1:
LOOSE PRODUCT AND BROAD GEOGRAPHIC MARKET DEFINITION
IN THE SBC PROPOSAL

LEGEND

Central Office = ○

CLEC with a switch = B

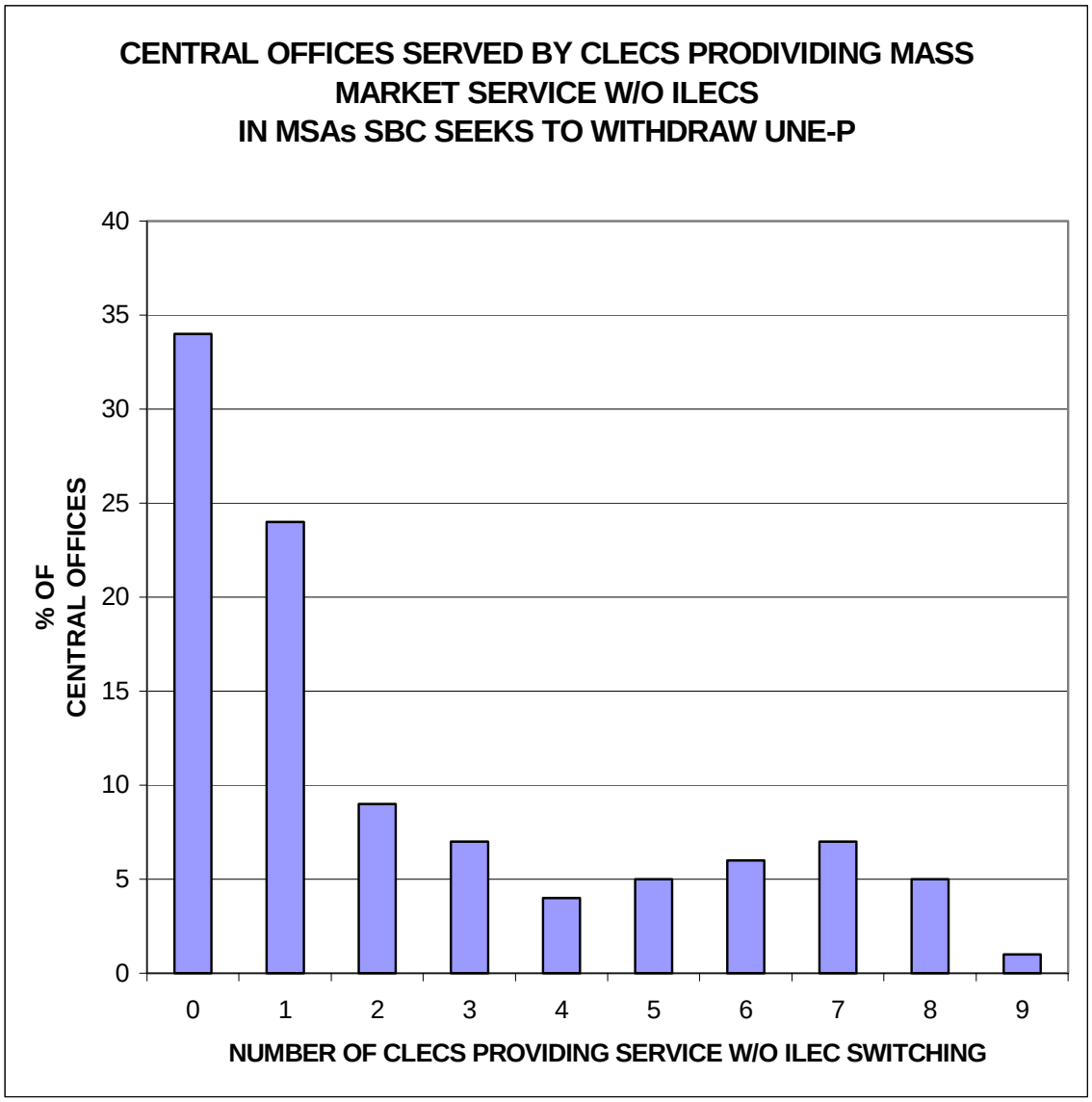
CLEC with a switch serving small business, but not residential = B

CLEC without a switch but serving mass market w/o ILEC switch = A

Transport to serve in central office w/o a switch = ⟶

Meeting 3 CLEC standard by SBC loose definition = ---------

EXHIBIT MNC-2:



SOURCE: SBC Texas/TX 28607, Joint CLEC RFI 1-11A-1; 1-1-3.

EXHIBIT MNC-3:
SOURCES FOR TEXAS CENTRAL OFFICE DATABASE

VARIABLE	SPREAD SHEET	COLUMN
NUMBER OF CLECS	CLEC-RFI_11_Attachemnt	D=Total E=Individual CLEC CLEC Mass Market Lines = G+H+I (-1 = uncontested)
MASS MARKET LINES	RETAIL RESPONSE 1.5 REVISED	A-Residential B-Small Business C-Medium Business D-Large Business
ENTERPRISE RATIO		[(C+D)/(A+B)]
RATE GROUP	TX DATA FILE 1	V
UNE ZONE		W
MSA		X
TOTAL WORKING LINES		AC
TOTAL EELS	TX 1-23 EELS	
2 WIRE EELS		
ILDC	JOINT CLEC 1ST SET RFI 1-6	C
TOTAL DLC		A+B+C+D
RIDLC =		C/Total Working Lines
RTOTDLC =		Total DLC/Total Working Lines

EXHIBIT MNC-4:

ECONOMIC STRUCTURE ANALYSIS OF SWITCHING ENTRY

Simple Correlation Coefficients Number Of ClECs As Dependent Variable

INDEPENDENT VARIABLE	ALL CENTRAL OFFICES	TARGET CENTRAL OFFICES
MMLINES	.63***	.53***
MIXLINES	.43***	.41***
TOTAL EELS	.67***	.67***
2-WIRE EELS	.31***	.46***
RATE GROUP	.67***	.27***
UNEZONE	.63***	.23***
RATIO OF IDLC	.05	-.03

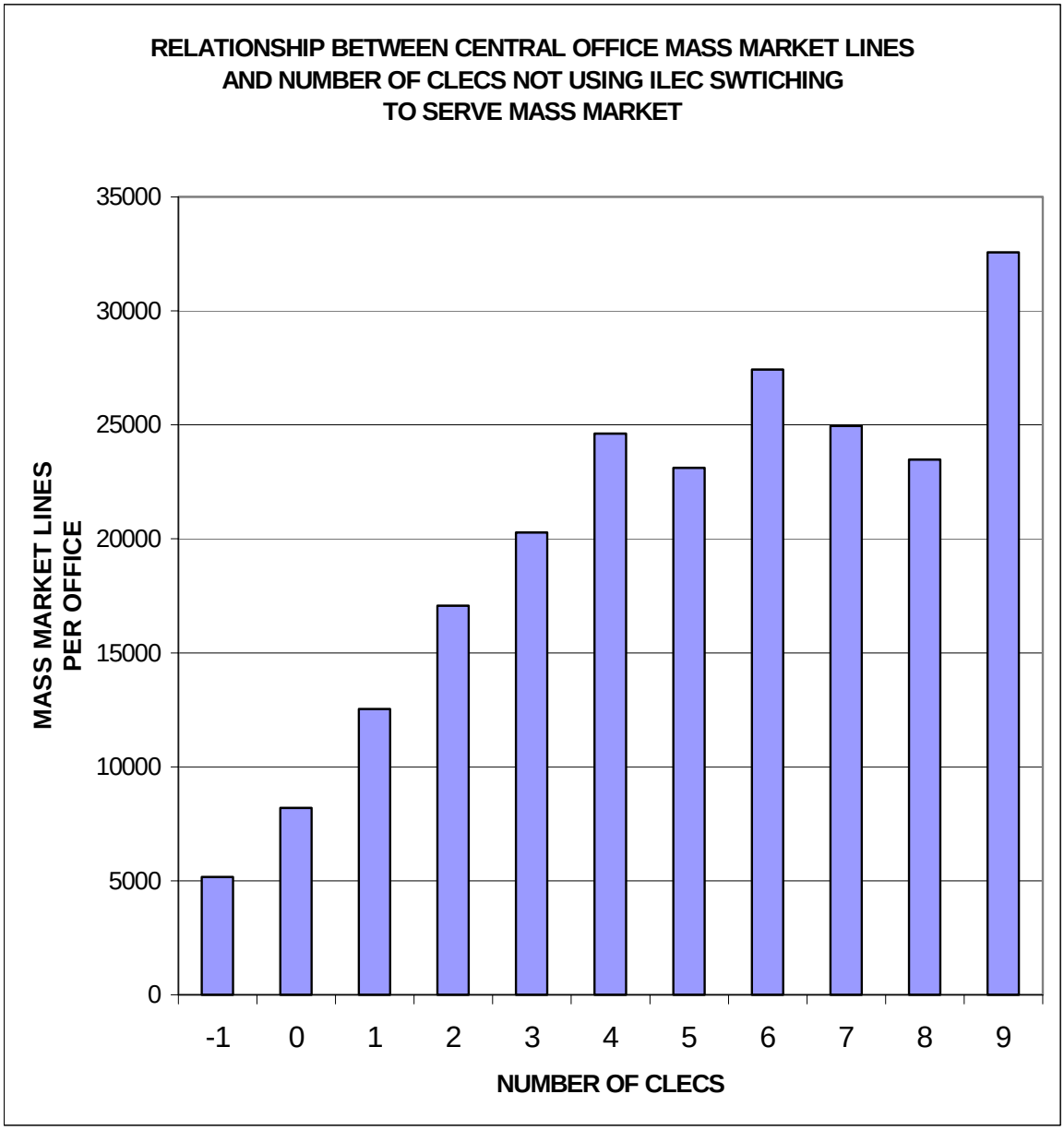
*** Significant at the .001 level

Beta Coefficients In A Multiple Regression Of Central Office Characteristics On Number Of Clecs Providing Mass Market Service Without Using Ilec Switching

	All	Target	MSA	MSA	MSA	MS	MSA
MMLINES	.34**	.41***	.52***	.73***	.61***	..08	.49***
MIXLINES	.21***	.31***	.33***	.39***	.42**	.46***	.38***
TOTAL EELS	.34***	.39***	.37***	.07	.13	.57***	.38***
RATIO OF IDLC	-.04	.01	.10	-.29*	-.15*	0	-.02
UNEZONE	.25***	.04	.29***	0	.16	.03	.02
Adjusted R^2	.68	.61	.76	.68	.82	.54	.82

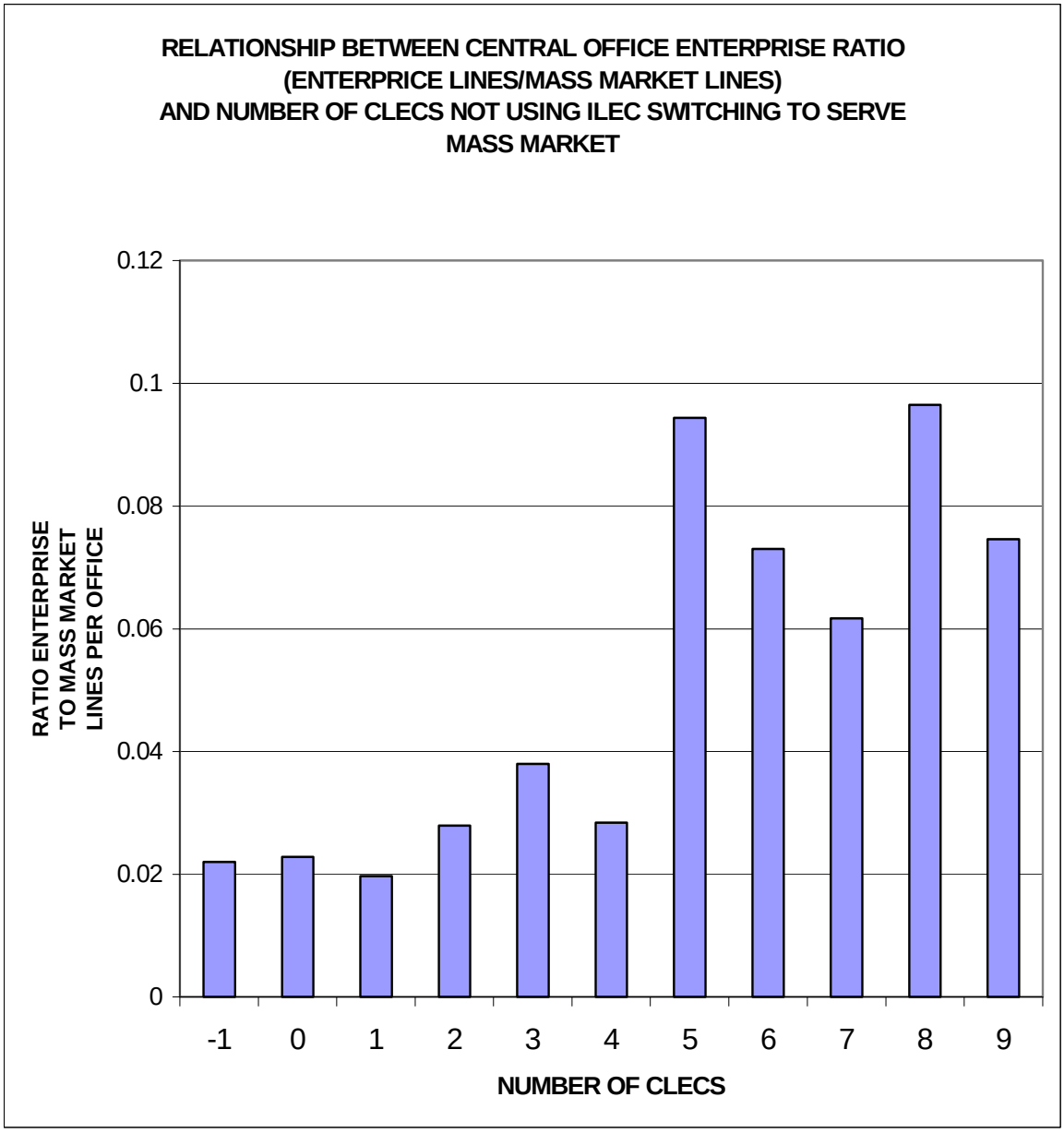
*** Significant at the .001 level

EXHIBIT MNC-5:



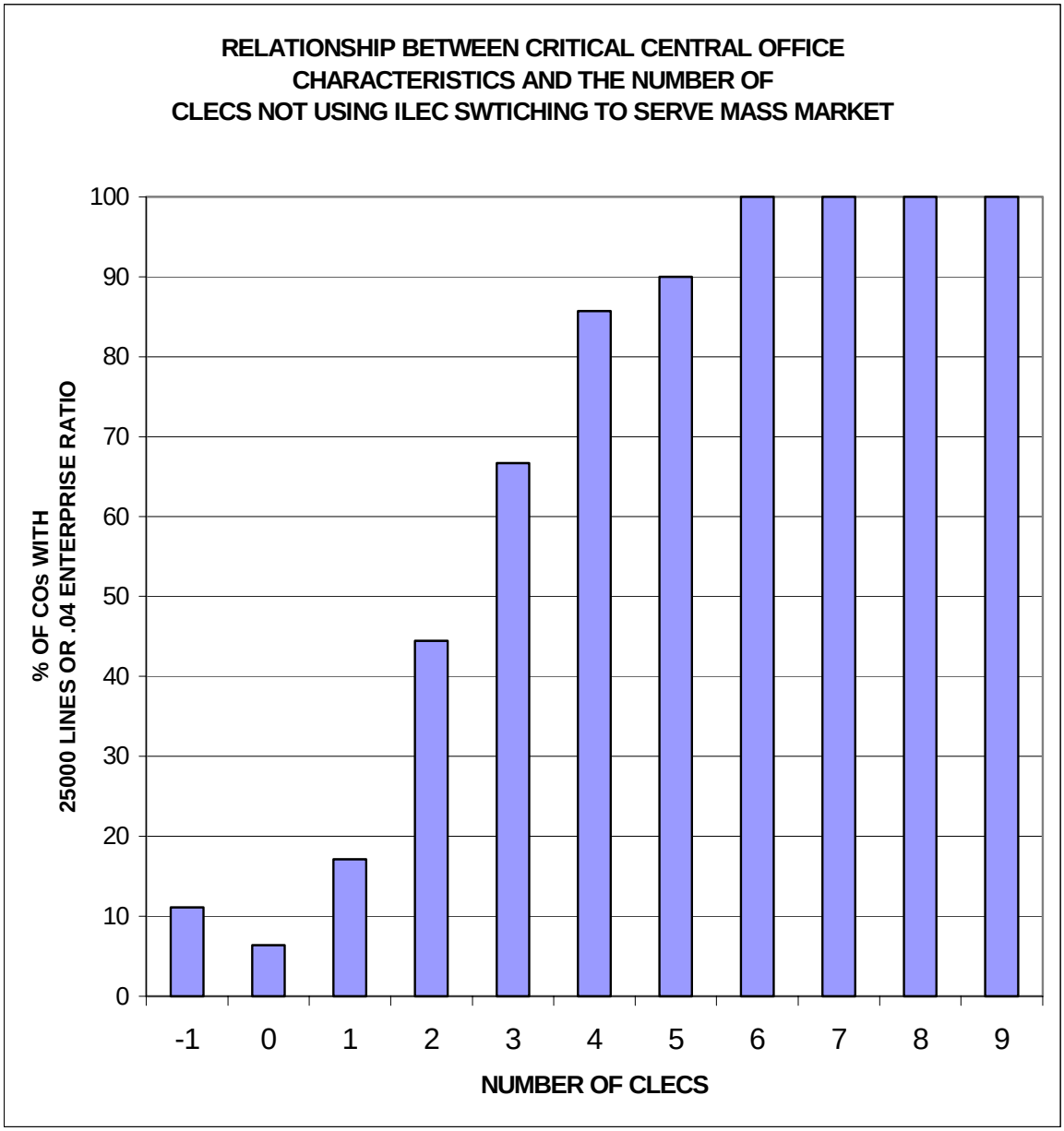
Source: Texas Central Office Data Base.

EXHIBIT MNC-6:



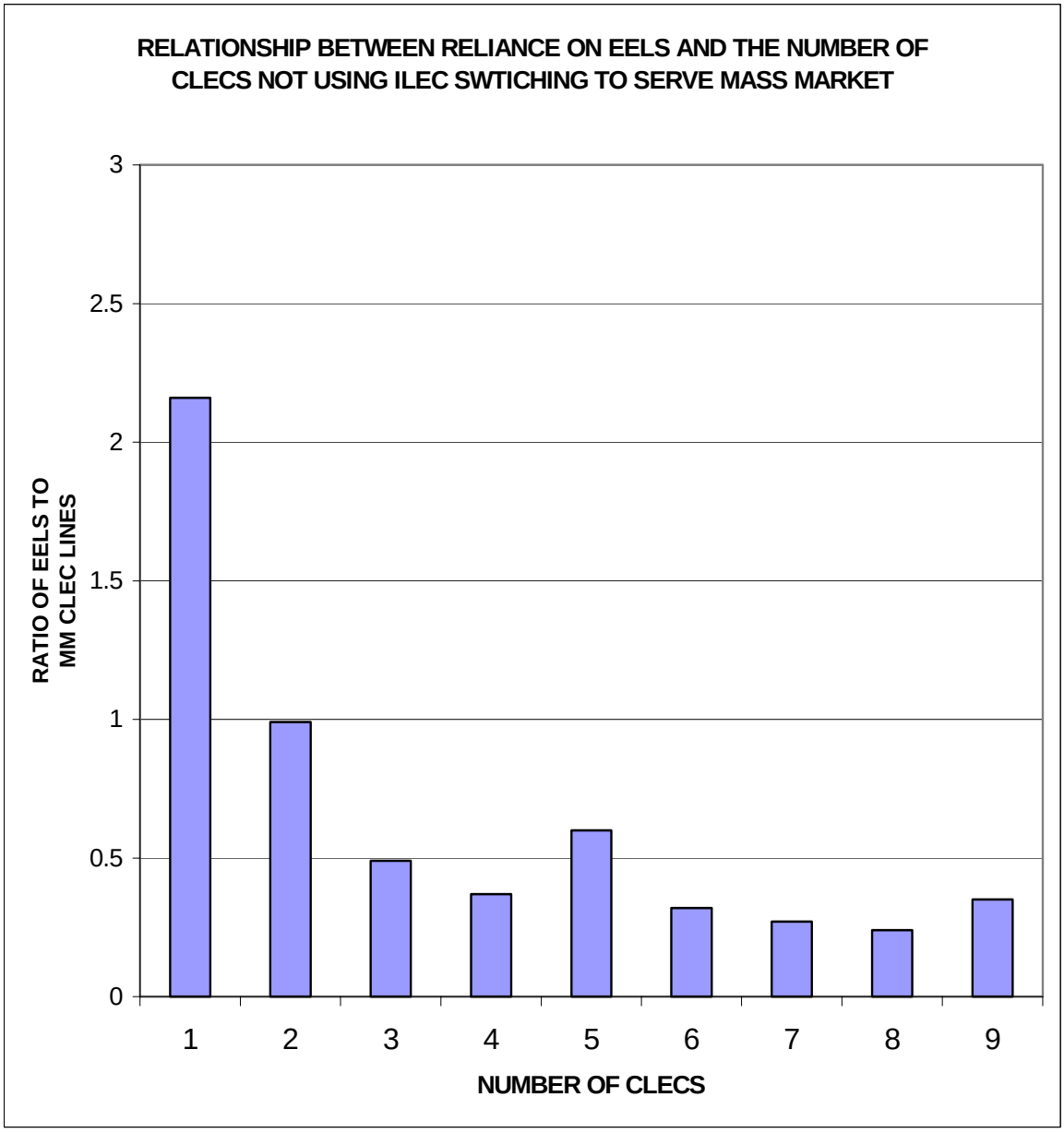
Source: Texas Central Office Data Base.

EXHIBIT MNC-7:



Source: Texas Central Office Data Base.

EXHIBIT MNC-8:



Source: Texas Central Office Data Base.

Exhibit MNC-9

Page 1 of 1

EXHIBIT MNC-9:

PERCENT OF CENTRAL OFFICES IN EACH MSA

ENTERED BY CLECS SERVING MASS MARKETS

WITHOUT ILEC SWITCHING

	CLEC1	CLEC2	CLEC3	CLEC4	CLEC5	CLEC6	CLEC7	CLEC8	CLEC9	CLEC10	CLEC11
MSA1	33	71	29	33	33	38	23	19	0	0	0
MSA2	0	43	0	0	0	0	29	0	43	0	0
MSA3	33	0	36	67	48	51	0	21	0	76	30
MSA4	4	0	4	42	29	42	0	4	0	25	29
MSA5	40	28	23	53	34	53	8	25	0	0	0
MSA6	24	32	20	40	36	36	8	4	0	0	16

Source: Texas Central Office Data Base.

EXHIBIT MNC-10

CATEGORIZATION OF CENTRAL OFFICES IN TARGET MSAS

BY ALTERNATIVE TRIGGER CRITERIA

(PERCENT OF CENTRAL OFFICES)

		Additional Trigger Criteria			
		None	Minimum Size	No Cable	Minimum Size Plus No Cable
Number Of CLECS	Category				
Less Than 3 Or	Impaired	57	66	62	69
3,4 Small					
3 Or 4, + 1 Large	Marginal	14	5	12	3
5 Or More Small	Marginal	0	14	0	13
5 Or More, + 1 Large	Non-Impaired	29	15	27	14

Source: Texas Central Office Data Base.

LEGEND: Minimum Size = One CLEC larger than 1% market share.
No cable = Cable excluded from CLEC count.

EXHIBIT MNC-11:

ECONOMIC STRUCTURE ANALYSIS EXCLUDING CABLE

Simple Correlation Coefficients Number Of Clecs As Dependent Variable

INDEPENDENT VARIABLE	ALL CENTRAL OFFICES	TARGET CENTRAL OFFICES
MMLINES	.60***	.53***
MIXLINES	.45***	.42***
TOTAL EELS	.68***	.68***
2-WIRE EELS	33***	.48***
RATE GROUP	.56***	.24***
UNEZONE	.62***	.24***
RATIO OF IDLC	.04	.02

***significant at the .001 level, significant at the .01 **, * significant at the .05 level.

Source: Texas Central Office Data Base.

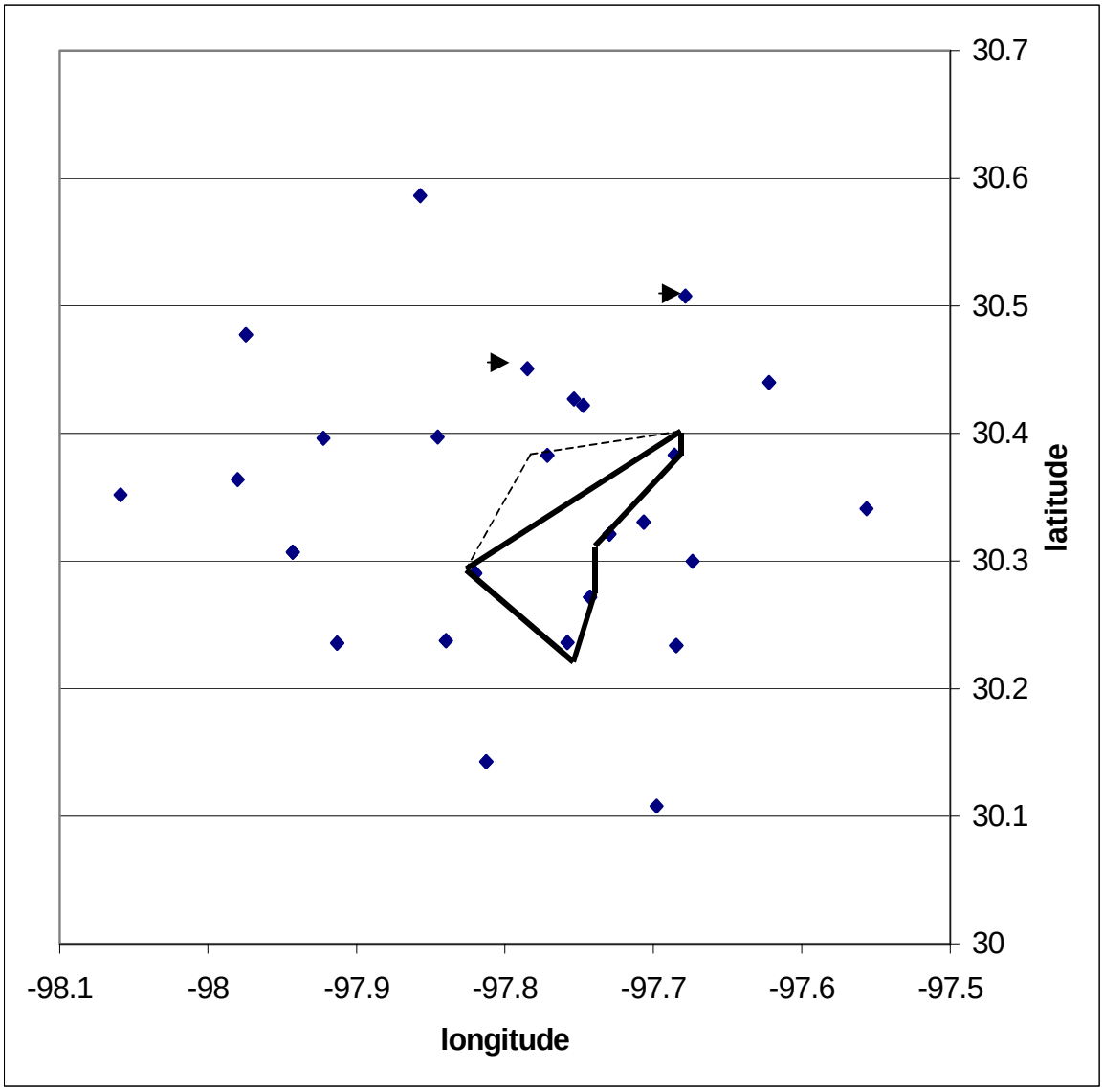
Beta Coefficients In A Multiple Regression Of Central Office Characteristics On Number Of Clecs Providing Mass Market Service Without Using Ilec Switching

	All	Target	MSA	MSA	MSA	MSA	MSA
MMLINES	.36**	.41***	.40***	.72***	.53***	.08	.42***
MIXLINES	.38***	.41***	.33***	.37***	.36**	.45***	.33***
TOTAL EELS	.38***	.41***	.33***	.08	.12	.57***	.43***
RATIO OF IDLC	-.05	.02	.03	-.24***	-.23*	0	-.09
UNEZONE	.12***	.02	.11***	.11	.18	-.04	.02
Adjusted R^2	.64	.62	.74	.74	.75	.54	.76

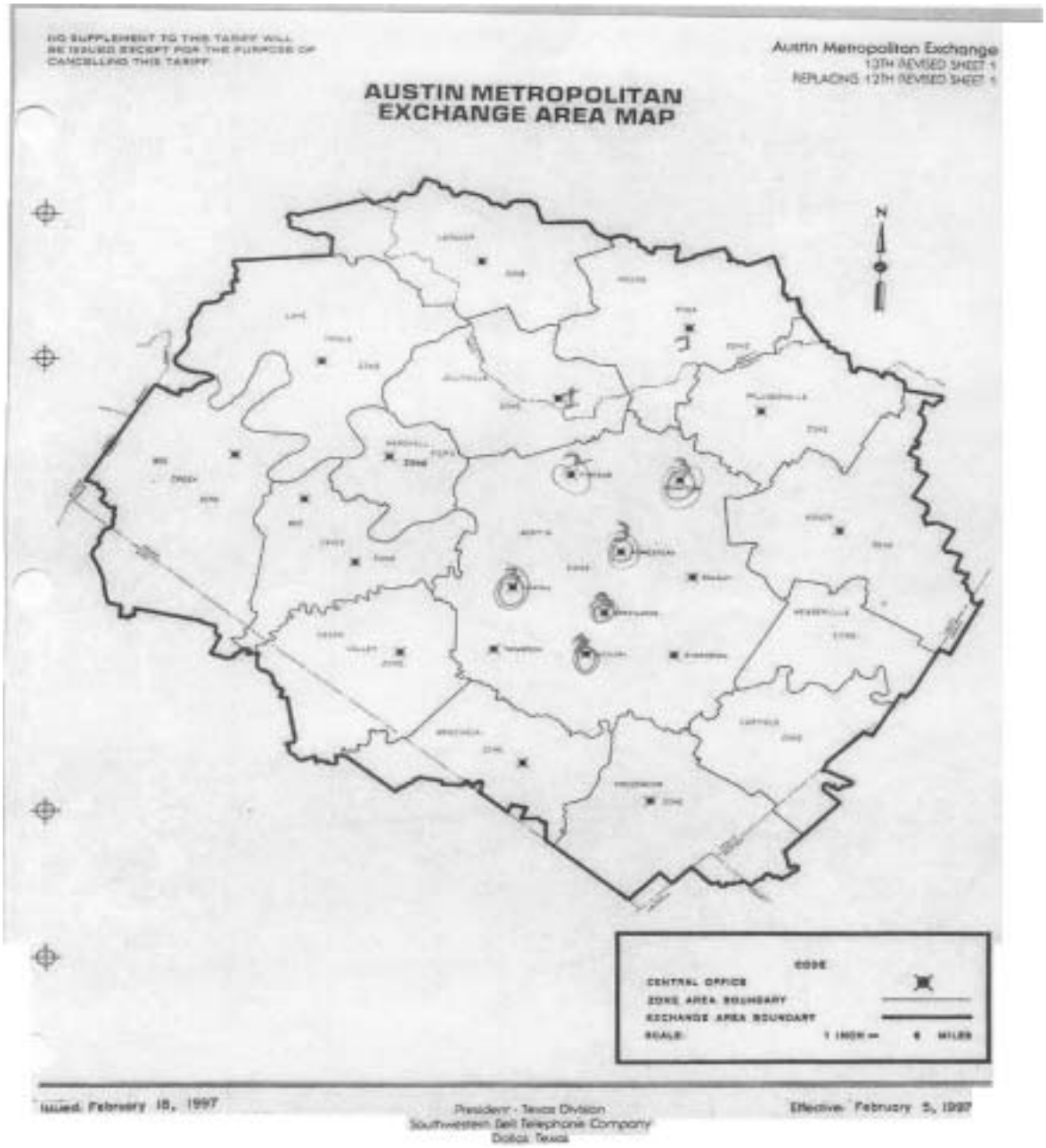
***significant at the .001 level, significant at the .01 **, * significant at the .05 level.

Source: Texas Central Office Data Base.

EXHIBIT MNC-12:
AUSTIN SWITCH ENTRY

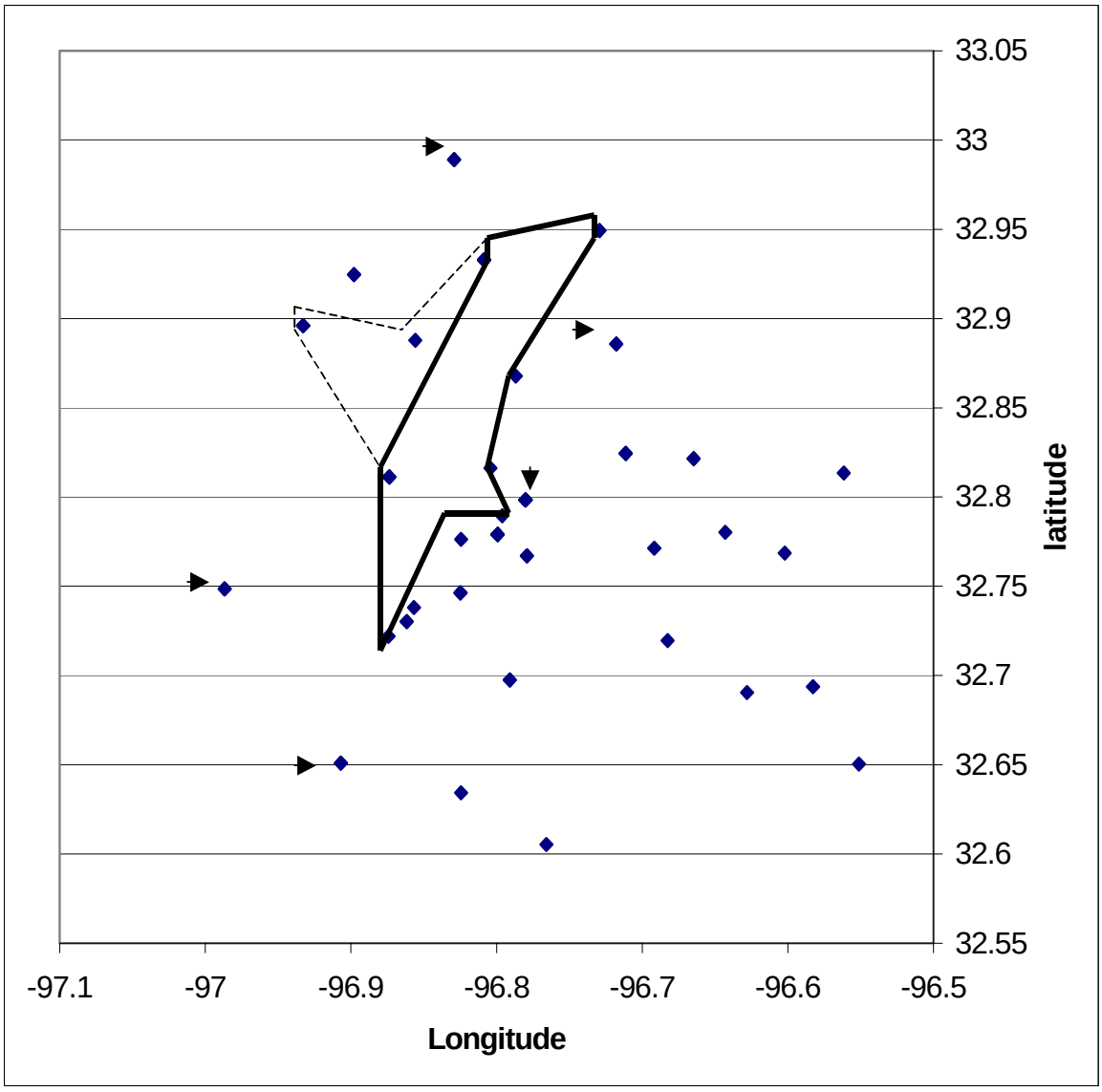


LEGEND : ▬ Nonimpaired; --- Marginal (5, small CLEC); ▶ Marginal (3,4 CLEC)

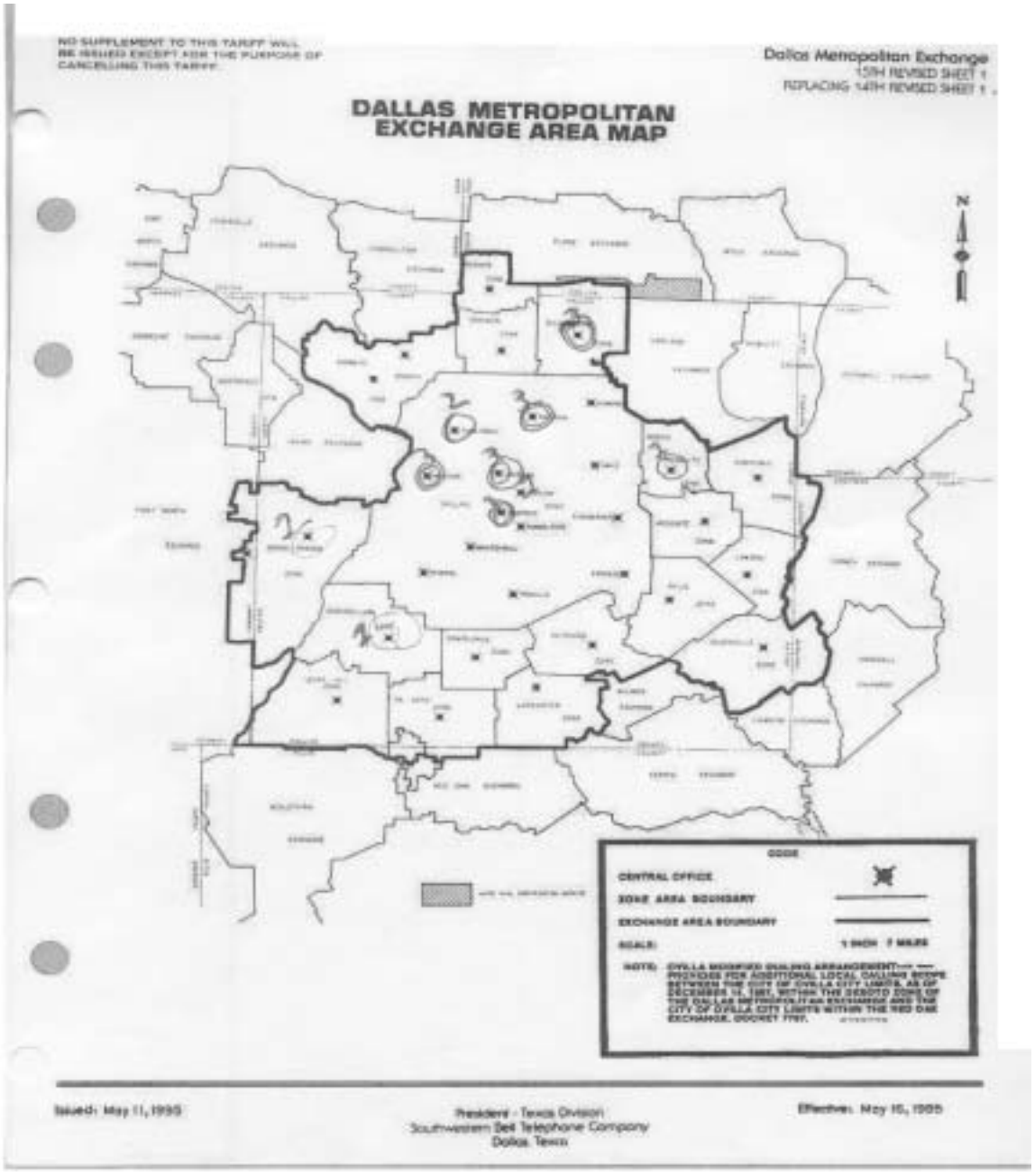


Legend: 1=Marginal (3,4); 2=Marginal 5; 3= Unimpaired.

EXHIBIT MNC-13:
DALLAS SWITCH ENTRY MAP

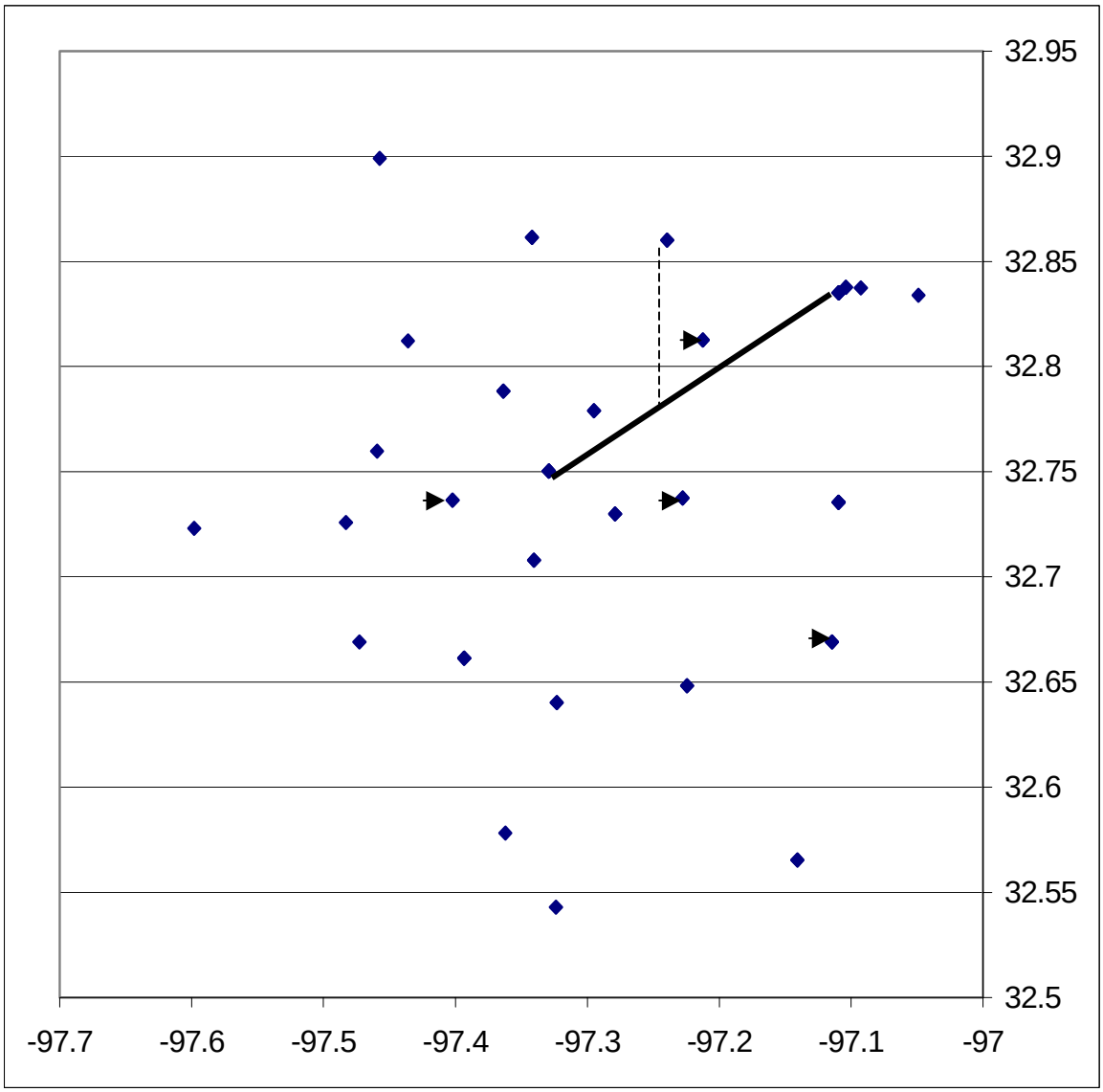


LEGEND : ━━ Nonimpaired; --- Marginal (5, small CLEC); ▶ Marginal (3,4 CLEC)

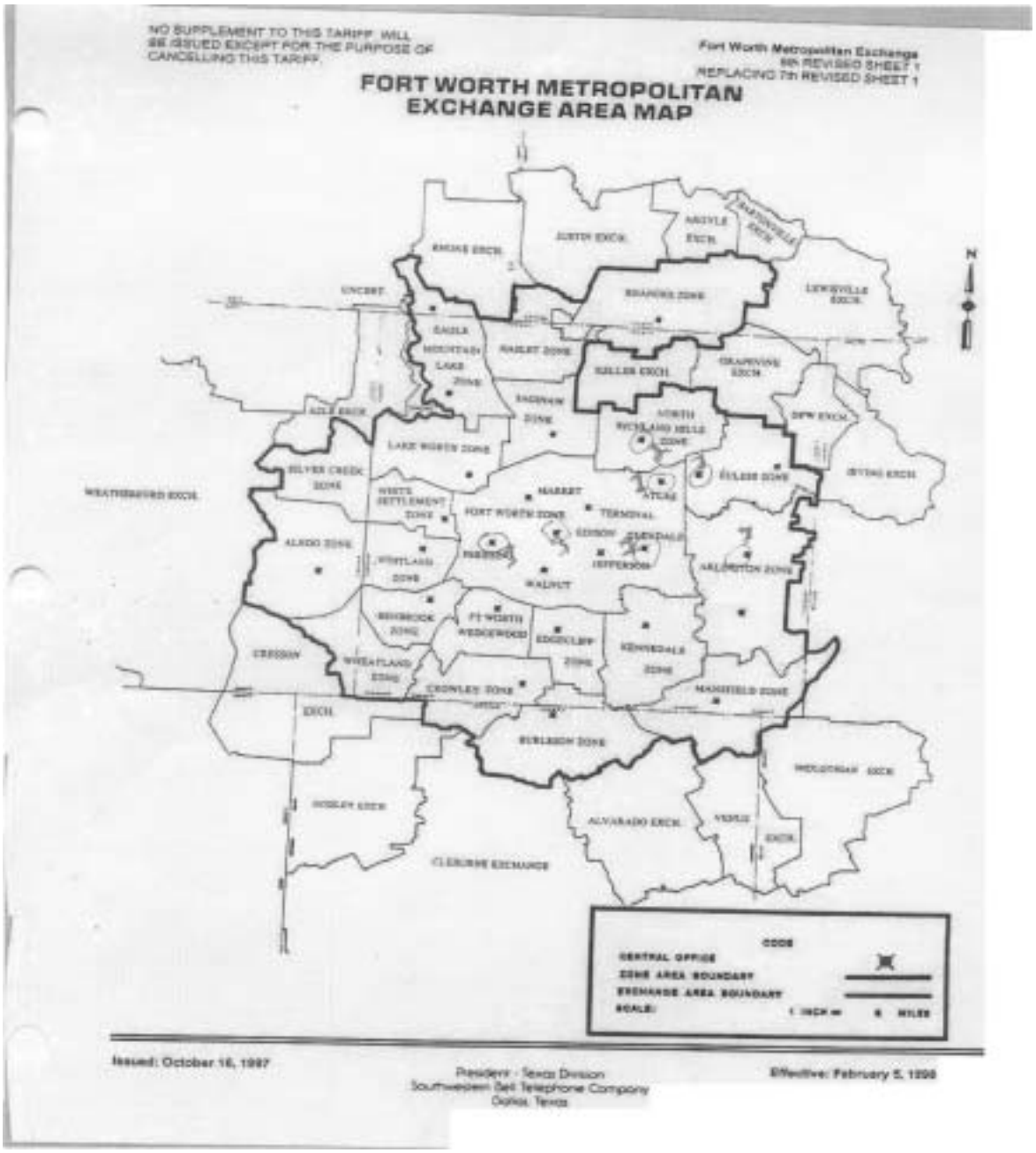


Legend: 1=Marginal (3,4); 2=Marginal 5; 3= Unimpaired.

EXHIBIT MNC-14:
FORT WORTH SWITCH ENTRY MAP

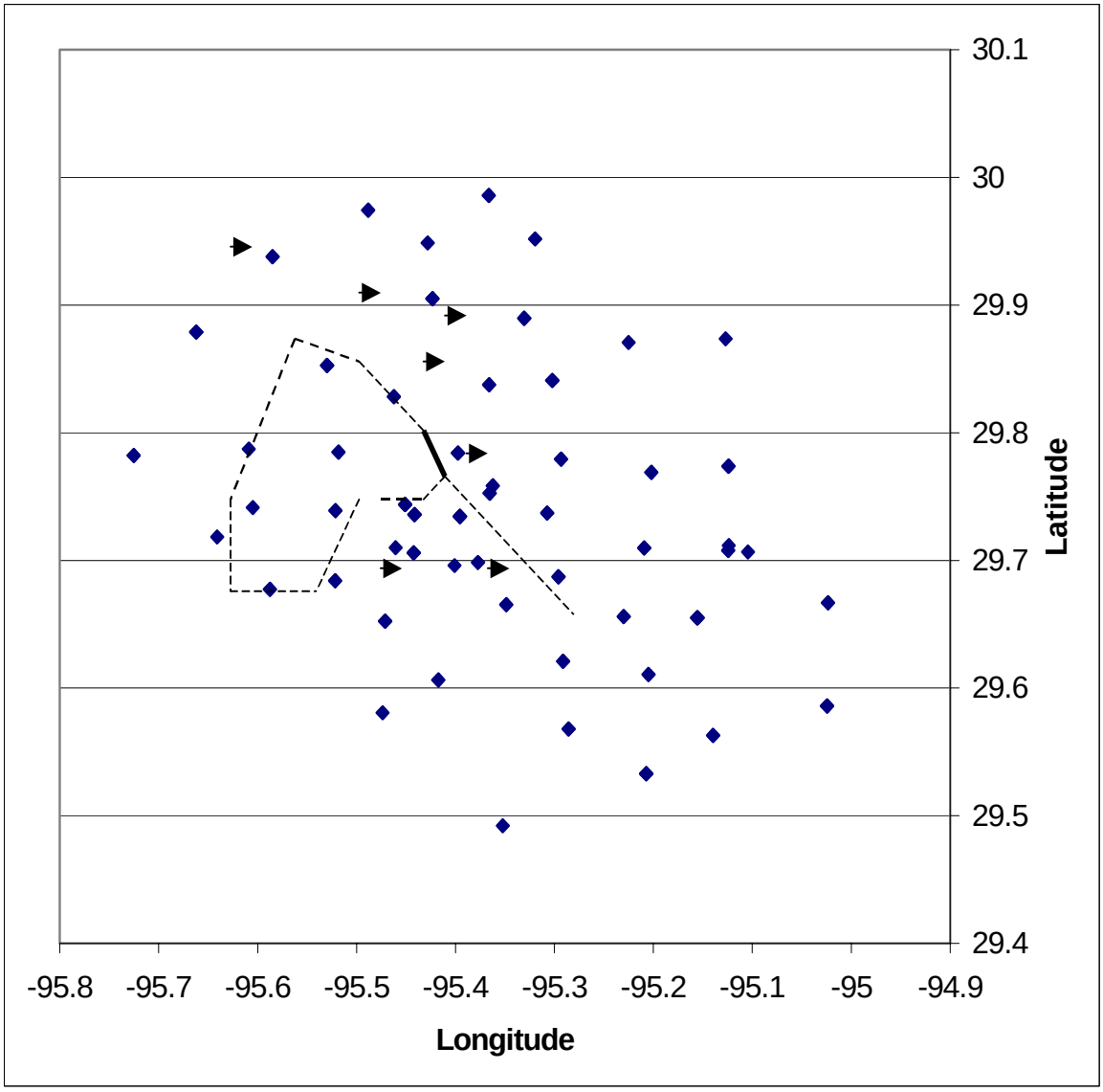


LEGEND : Nonimpaired; --- Marginal (5, small CLEC); Maringal (3,4 CLEC)

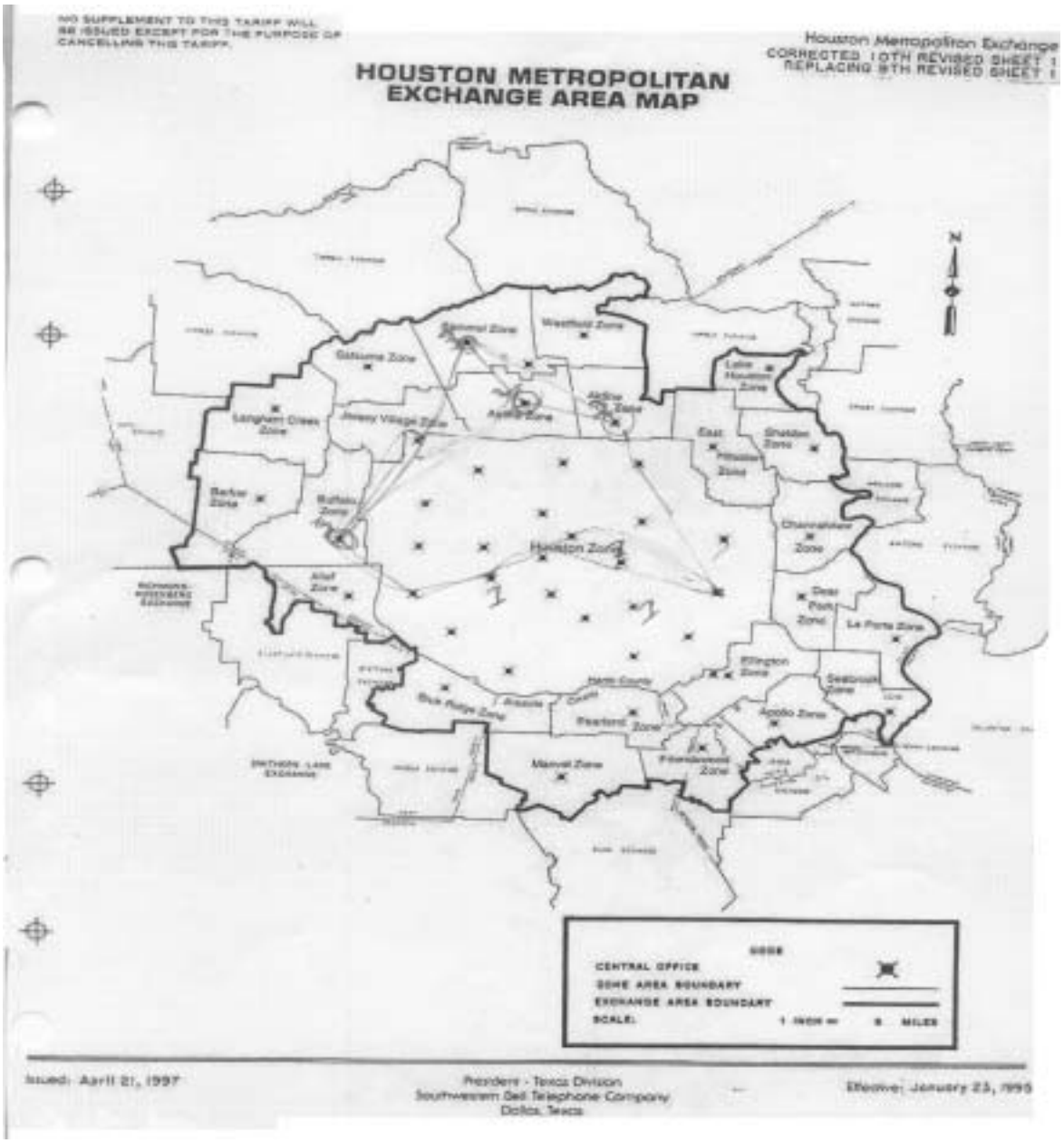


Legend: 1=Marginal (3,4); 2=Marginal 5; 3= Unimpaired.

EXHIBIT MNC-15:
HOUSTON SWITCH ENTRY MAP

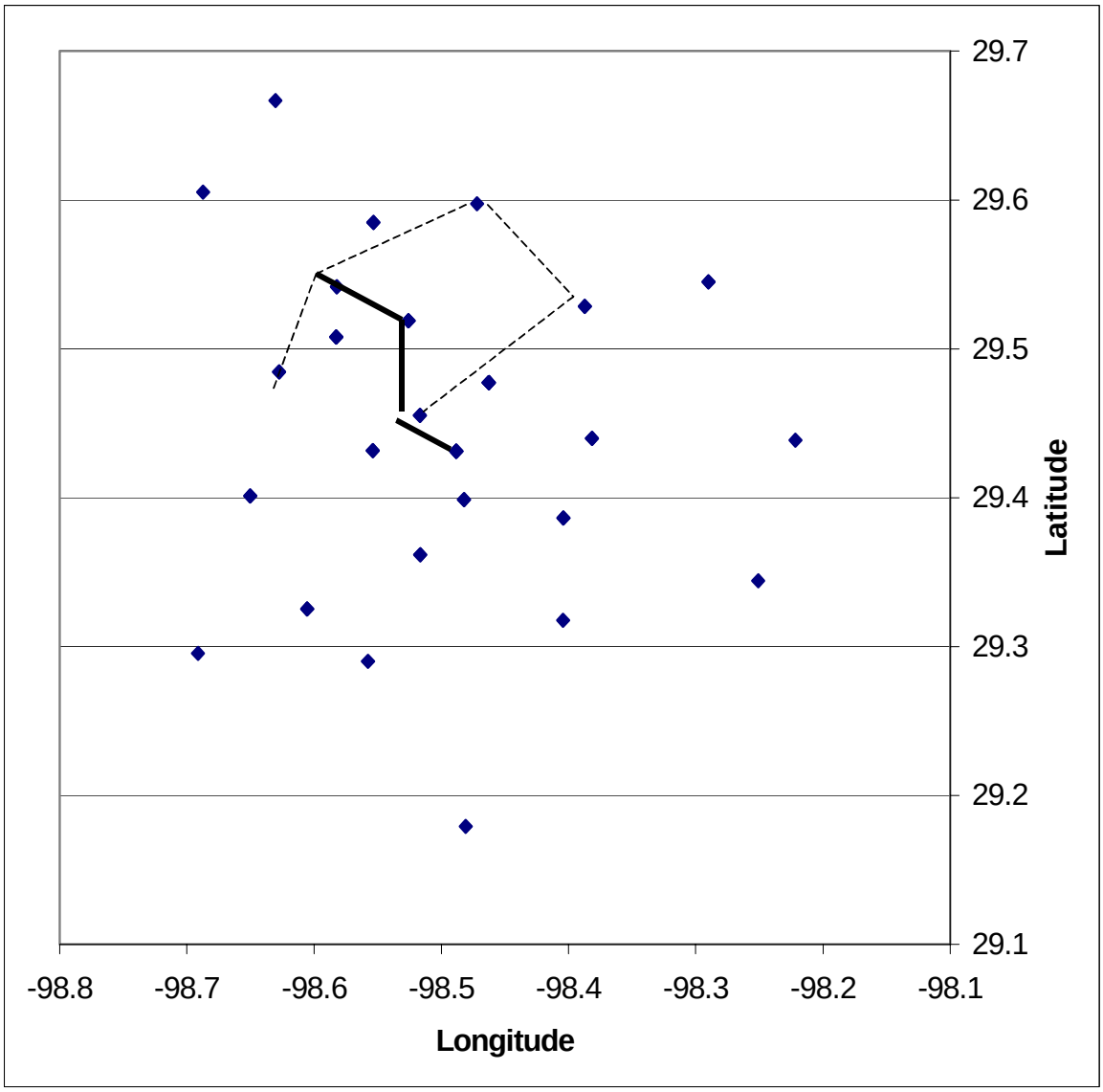


LEGEND : ━━ Nonimpaired; --- Marginal (5, small CLEC); ▶ Maringal (3,4 CLEC)

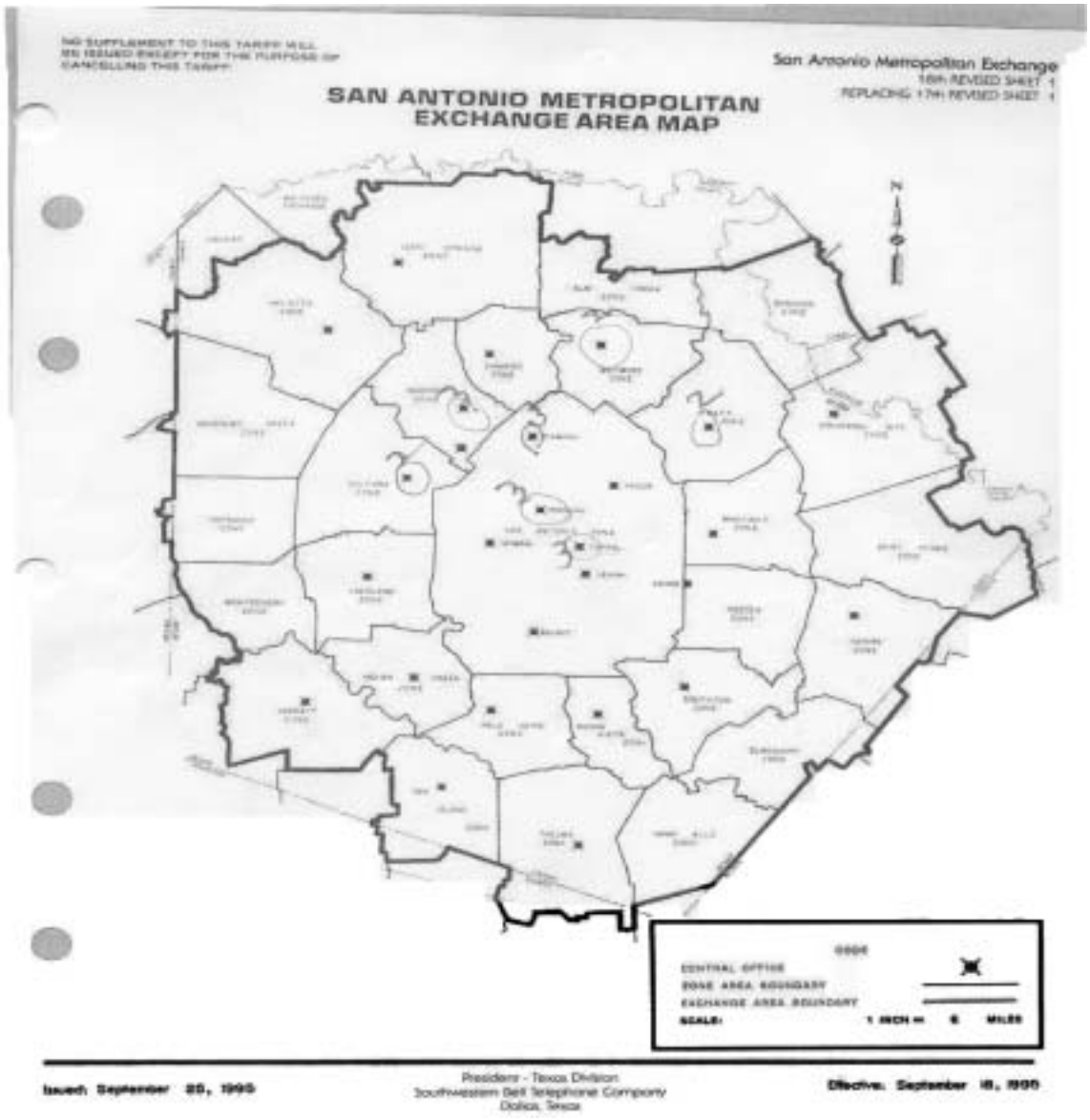


Legend: 1=Marginal (3,4); 2=Marginal 5; 3= Unimpaired.

EXHIBIT MNC-16:
SAN ANTONIO SWITCH ENTRY MAP



LEGEND : ━━ Nonimpaired; --- Marginal (5, small CLEC); ▶ Maringal (3,4 CLEC)



Legend: 1=Marginal (3,4); 2=Marginal 5; 3= Unimpaired.

EXHIBIT MNC-17

IMPAIRMENT CATEGORIZATION OF CENTRAL OFFICES

NUMBER OF CLECS	Category	% of Central Office	% of Mass Market Lines
LESS THAN 3	Impaired	66	54
3 OR 4	Marginal	5	4
5 OR MORE SMALL	Marginal	14	25
5 OR MORE LARGE	Unimparied	15	17

PERCENT OF UNE-P LINES IN TARGET MSA
BY CENTRAL OFFICE IMPAIRMENT CATEGORY

CATEGORY	IMPAIRMENT	MSA1	MSA2	MSA3	MSA4	MSA5	MSA6	TOTAl
LESS THAN 3 OR ¾ NO LARGE CLECS	Impaired	45	70	35	34	53	69	45
¾ WITH LARGE CLEC	Marginal	18	16	12	32	0	31	21
5 OR MORE NO LARGE	Marginal	5	6	5	32	26	0	18
5 OR mORE, + 1 LARGE	Non-impaired	32	8	48	2	21	0	16

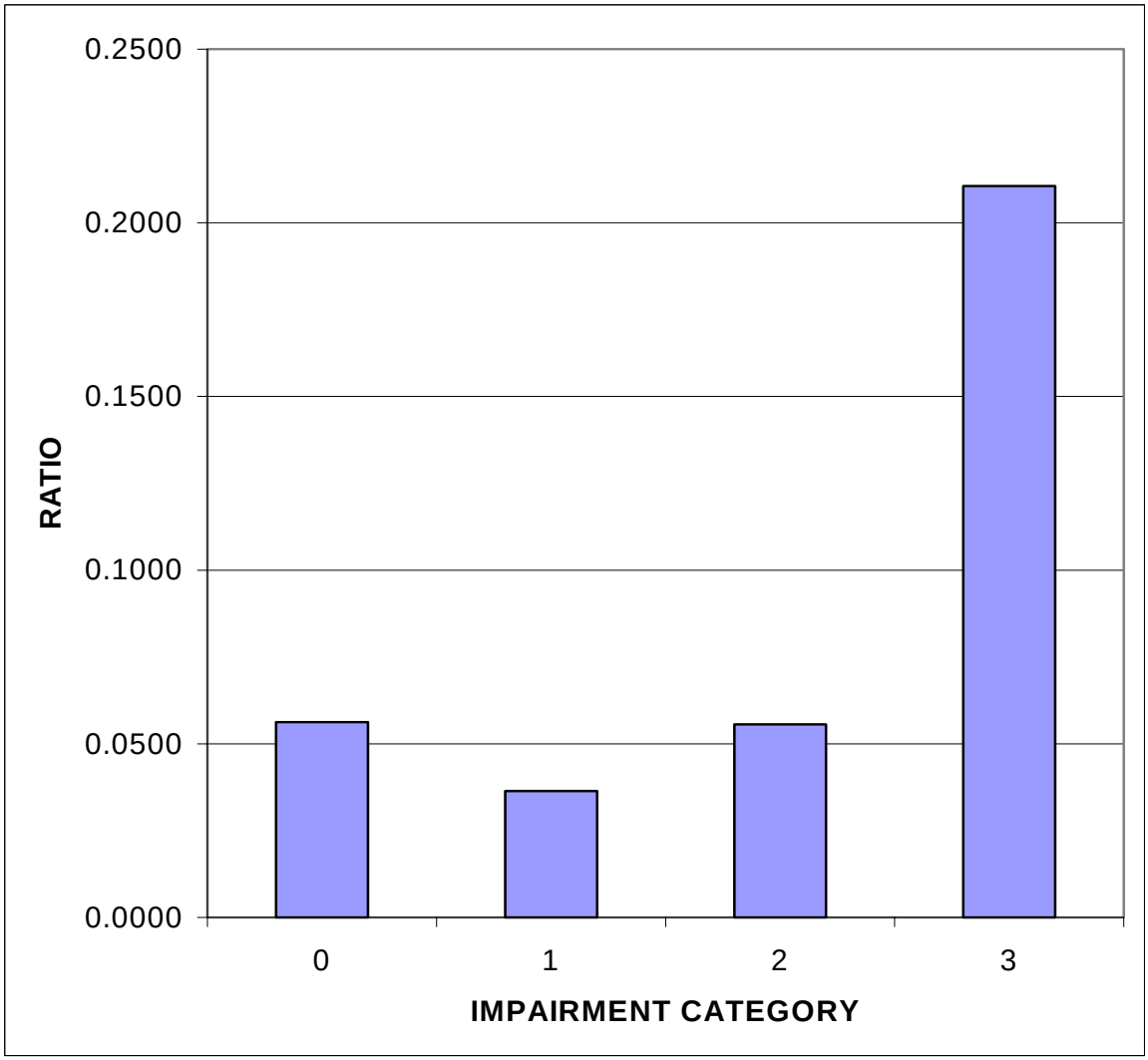
Source:SBC Texas/ OPC Second RFI, 3/9/04.

AARP AVERAGE CENTRAL OFFICE CHARACTERISTICS BY OPUC CATEGORY

OPUC Category	Austin	Dallas	Ft. Worth	Houston	San Antonio
TOTAL LINE COUNT (000)					
IMPAIRED	14.9	14.6	27.2	28.1	14.1
MARGINAL 3,4		58.8	52		23.7
MARGINAL 5	56.8	66.4	83.2	116	84.6
UNIMPAIRED	105	111.7	86.6	85.9	82.9
% ENTERPRISE					
IMPAIRED	41	36	46	46	28
MARGINAL 3,4		48	50		75
MARGINAL 5	62	71	44	65	46
UNIMPAIRED	66	74	68	82	61
LINE DENSITY					
IMPAIRED	274	510	874	1280	307
MARGINAL 3,4		2515	1613		6030
MARGINAL 5	1759	8099	1569	5656	1074
UNIMPAIRED	4119	5560	3971	12108	3538
COLLOCATIONS					
IMPAIRED	4	2	4	5	2
MARGINAL 3,4		10	9		13
MARGINAL 5	22	22	15	19	15
UNIMPAIRED	20	20	16	25	20
SBC CLEC COUNT					
IMPAIRED	0.6	0.8	0.8	0.6	0.3
MARGINAL 3,4		3.4	3		3
MARGINAL 5	7	6.6	6	6.5	6
UNIMPAIRED	7.2	7.6	6.5	6	6.4
OPUC CO COUNT					
IMPAIRED	21	37	26	21	58
MARGINAL 3,4		5	5	2	
MARGINAL 5	1	5	5	1	13
UNIMPAIRED	5	8	8	3	2

Testimony of Buckalew on Behalf of AARP.

EXHIBIT MNC-19
RATIO OF UNE-P TO UNE-L MASS MARKET LINES
BY CENTRAL OFFICE IMPAIRMENT CATEGORY



Legend: 0=impaired; 1=marginal (3,4); 2=marginal (5 small); 3= unimpaired.

Source:Texas Central Office Database; SBC Texas/ OPC Second RFI, 3/9/04.